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SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA CALIF
DIGITIZED NAVIGATION, DEPTH AND MAGNETIC DATA FROM SCRIPPS CRUI--ETC(U)
JUN 78 S M SMITH, U G ALBRIGHT
N00014-75-C-0152

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DIGITIZED NAVIGATION, DEPTH AND MAGNETIC DATA
FROM SCRIPPS CRUISES PROCESSED THROUGH 1977

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S. M. Smith, U. G. Albright, V. W. Psaropulos, G. Papadopoulos, L. Hydock

SIO Geological Data Center

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<p>L The SIA</p> <p>20. ABSTRACT (Continue on reverse side if necessary and identify by block number)</p> <p>The Geological Data Center (GDC) coordinates underway data collection; processes the digital navigation, depth and magnetics; and produces cruises reports and computer generated plots for archiving and distribution. The data center also archives, microfilms, and indexes seismic profiler (airgun), echosounder and magnetometer records. (Gravity data are archived and processed separately) under the direction of LeRoy M. Dorman.)</p> <p>→ cont on P. 1</p>		

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DIGITIZED NAVIGATION, DEPTH AND MAGNETIC DATA
FROM SCRIPPS CRUISES PROCESSED THROUGH 1977,

10

By

S. M. | Smith, U. G. | Albright, V. W. | Psaropulos, G. | Papadopoulos, L. | Hydock

SIO Geological Data Center

SIO Reference Report, 78-15

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Issued June 1978

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ODC	Buff Section
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1.0 INTRODUCTION

The Geological Data Center (GDC) coordinates underway data collection; processes the digital navigation, depth and magnetics; and produces cruise reports and computer generated plots for archiving and distribution. The data center also archives, microfilms, and indexes seismic profiler (airgun), echosounder and magnetometer records. (Gravity data are archived and processed separately under the direction of LeRoy M. Dorman.)

The report on the digitized depth and magnetic data includes a cruise leg index; track charts labeled with the cruise identifiers; descriptions of the standard forms of output; and information about formats and obtaining digital data. It is essentially an updated version of the SIO Reference Report 76-4 issued in 1976.

Between 1976 when the last general index report was issued and December 1977, the cutoff date for this report, 33 legs of current Scripps cruises and 13 legs of Glomar Challenger (Deepsea Drilling Project) have been processed by the data center. Navigation, but no depth and magnetics, has also been processed for the early legs 4 through 12 of the Challenger. (Navigation = 193,734 miles; magnetics = 131,515 miles; and depth = 131,862 miles.)

The total amounts in the SIO digital underway data bank are now:

Navigation	= 1,238,634 miles
Magnetics	= 1,125,415 miles
Depth	= 1,063,262 miles

2.0 DATA COVERAGE

2.1 SIO Data - A world track chart of Scripps cruises with digitized depth or magnetic data is shown in Figure 1. Navigation and magnetics have been digitized for essentially all the SIO cruises which collected magnetic data from 1960 through 1977. Depths are also digitized for all cruises except for some of the older cruises prior to the mid-1960's. The Deep Sea Drilling Project (DSDP) cruises of the Glomar Challenger are complete between legs 15 and 56. Depth and magnetics have been done for portions of DSDP legs 7, 8 and 9; magnetics for leg 12; and depth and magnetics provided by Lamont Geological Observatory for legs 13 and 14. Digital navigation is also available for DSDP legs 4 through 12.

2.2 Non-SIO Data - Data from a dozen cruise legs collected on non-SIO ships but processed by our group are included in the index and incorporated in the SIO data base. In addition, the data center is archiving an increasing volume of digitized data collected by other institutions in response to requests made by SIO staff for data in specific areas. Most of these data are in the merge format of the National Geophysical and Solar-Terrestrial Data Center (Boulder, Colorado) (the NGDC "merge-merge" format). These data are not indexed in this report, but individual track plots of each cruise or data set at a scale of 0.16 inches/degree longitude (the data center's "world" scale) and a world-wide composite index are available for inspection at the data center.

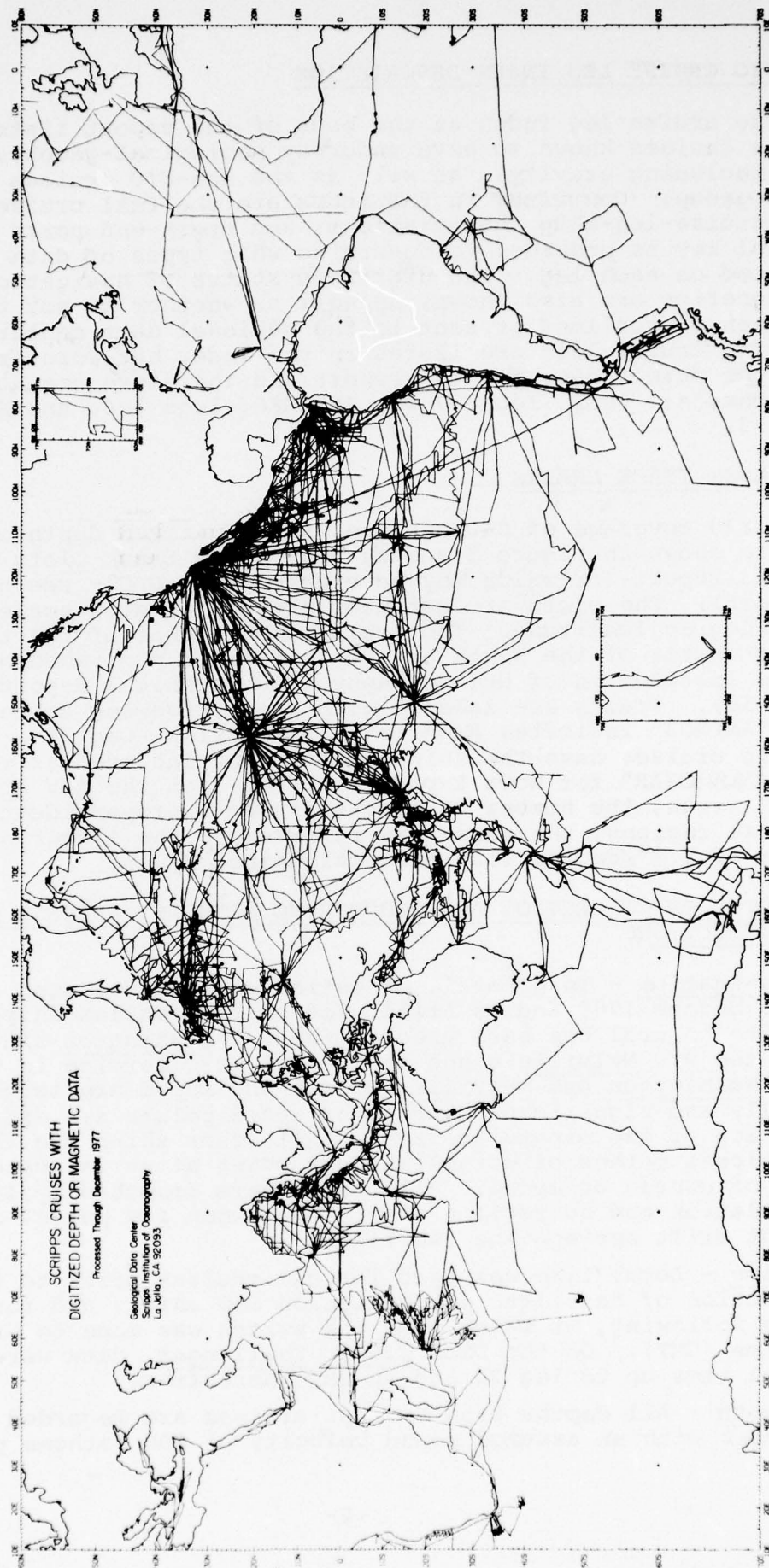


Figure 1

3.0 SIO CRUISE LEG INDEX DESCRIPTION

The cruise leg index at the back of the report lists all Scripps cruises known to have underway geological-geophysical data (including gravity), as well as the non-SIO cruises digitized by our group. Contained in the index are the full cruise name and ship; cruise-leg-ship abbreviations; and begin-end ports and dates. A symbol key is provided to determine what types of data were collected on each leg. The digitized status of navigation, depth and magnetics are also shown, as well as whether or not the data have been microfilmed or sent to the national data center. The following cruise legs are listed in the index but were processed after the cutoff date for the report and therefore are not on the track charts: DSDP, legs 57-59; INDOMED, legs 1-6; and GUAYMAS, legs 1-3.

4.0 INDEX TRACK CHARTS

World coverage of SIO cruises with digitized depth or magnetic data are shown in Figure 1 and on four index track plots accompanying this report (or which may be ordered from GDC - see back page of report). The plots are Mercator projection at a scale of 0.312 inches/degree longitude. The scale matches that of the two topographic charts of the North and South Pacific published by the Scripps Institution of Oceanography (IMR Technical Reports TR-17 and TR-56). Tracks are labeled with the cruise-leg abbreviation (e.g. "AMPHO3" indicates Amphitrite Expedition, Leg 3). A few two-ship cruises have the ship abbreviation included as well (e.g. "NOVAO7AR" for Nova Expedition, Leg 7 on the R/V Argo). In several areas, the number of tracks prevents proper identification. For these regions, the reader is referred to the larger plots at a scale of 1.2"/degree longitude maintained by GDC.

5.0 NOTES ON COLLECTION AND PROCESSING METHODS, UNITS & APPLIED CORRECTIONS

5.1 Navigation - In general, celestial control was used on all cruises before 1968 and is still used on the smaller ships. Satellite control has been used on the R/V Washington since 1968 and on the R/V Melville since it was put into service in 1970. On the Washington and Melville, course and speed are logged automatically and significant course and speed points are extracted from a log of two minute averages. All other ships use the conventional method of establishing a point at an indicated change of course or speed. All tracks were smoothed by linear interpolation and correction of drift between fix pairs, assuming constant drift between the two fixes.

5.2 Time - Local time was used for all cruises prior to the introduction of satellite navigation on SIO ships, and for several cruises following, at which time the switch was made to Greenwich Mean Time (GMT). On the DSDP Glomar Challenger, data were recorded in local time up to leg 22 and in GMT thereafter.

5.3 Depth - All depths from Scripps cruises are recorded in units of fathoms with an assumed sound velocity of 800 fathoms per second.

Prior to leg 45 of Glomar Challenger (DSDP), depths were recorded in the same units. From leg 45 to the present, depths are in meters with an assumed velocity of 1500 m/second. No Matthews Table, tidal or transducer depth corrections have been applied (transducer depth on Scripps ships ranges from 2 to 4 fathoms). The digitizing interval ranges between 1 and 6 minutes of ship time. Prior to 1967, the interval was 3 or 6 minutes and has usually been 5 minutes since then.

5.4 Magnetics - All magnetic values are in units of gamma with no corrections for diurnal variations. Magnetic anomalies were calculated by removing the regional field using IGRF 1965.0 for cruises processed prior to mid-1977 (through INDOPAC expedition and DSDP leg 53). IGRF 1975.0 has been used subsequently. For data stored in the CDC 3600 computer system, the field is calculated at points no farther apart than 500 miles along the track or when the course changes by 50 degrees, and a linear interpolation applied to the points between. Before 1967, most magnetics were digitized at 6 minute intervals. Since then, the digitizing interval has been 5 minutes to match the depth interval. There has, however, been an intermittent and recurring problem of digitizing time offset from the even 5 minutes for magnetics logged through the automatic logging systems on the two ships, Washington and Melville (e.g. values were logged at 02, 07, 12 minutes, etc., instead of 00, 05, 10). This time offset should be taken into account by those wishing to merge the magnetics with the depths.

6.0 DATA DISTRIBUTION POLICY

The following is a summary of the data distribution policy established by the Geologic Data Center Steering Committee. Questions regarding these policies should be directed to the committee chairman, who may be contacted through the data center.

Underway data, except navigation, may be declared proprietary by a cruise leg chief scientist who may restrict its distribution for one year. After one year, the data will normally become available to others at Scripps, and at the end of two years will be sent to the national data center to be made available to anyone. Data not declared proprietary will be held for institution use for a total of two years. These are general guidelines only, and the steering committee considers exceptions on a case-by-case basis. Users who request data that is on "hold" will be referred to the steering committee or chief scientist by the data center staff, who maintain lists of current "hold" cruises.

Data from Glomar Challenger is declared proprietary by the Deep Sea Drilling Project for 12 months after each leg and is then sent to the national data center. Challenger records and plots are archived by DSDP (Barbara Long, Science Information Facility, Deep Sea Drilling Project, Scripps Institution of Oceanography, La Jolla, CA. 92093. Phone: (714) 452-3506).

Non-Scripps users requesting digital data will be referred to

the national data center if the data in question has previously been sent to that facility. (Contact Marine Geology and Geophysics Branch, National Geophysical and Solar-Terrestrial Data Center, Code D621, Boulder, CO. 80302. Phone: (303) 499-1000, ext. 6338).

7.0 STANDARD FORMS OF OUTPUT - PLOTS AND LISTINGS

Beginning in January 1972, the forms of output given below have been generated for each leg of major cruises on the two ships having shipboard computers (R/V Washington and Melville) and for geological/geophysical expeditions on smaller vessels. These data are normally processed within one or two months after the end of each cruise leg.

7.1 Standard Reports, Plotted Output and Listings - For information on the availability and costs of reproduction of data in the following forms, contact S.M. Smith, Curator, Geological Data Center, (A-023), Scripps Institution of Oceanography, La Jolla, California 92093 (Telephone (714) 452-2752).

- A) "Informal Cruise Report and Index of Navigation, Depth, and Subbottom Profile Data", which contains:
 - a) Index Chart - gives track of cruise leg and boundaries of depth compilation plots (see below).
 - b) Track Charts - annotated with dates and hour ticks (scale = 0.312"/degree longitude).
 - c) Profiles - depth and magnetic anomaly vs. distance. Dates and positions of major course changes (greater than 30 degrees) are annotated. Sections of track having subbottom profile (airgun) records have a solid black line along the bottom of the profile.
- B) Navigation Plots - Annotated with date and hour ticks. Scale is 1.2"/degree longitude.
- C) Navigation listing of times and positions of course and speed changes, fixes and drift velocity.
- D) Depth compilation plots - depths printed along the track in fathoms (assumed sound velocity of 800 fm./sec.) at approximately 1 mile spacing, plotted at 4"/degree with standard Defence Mapping Agency BC series boundaries. Depths from leg 45 and later of DSDP Challenger are plotted in meters (1500 m/sec. velocity).
- E) Plots of magnetic anomaly profiles along track - map scale = 1.2"/degree; anomaly scale between 15 N and 15 S latitude = 500 gamma/inch; anomaly scale north of 15 N and south of 15 S = 1000 gamma/inch, from values retrieved at approximately 1 mile spacing and regional field removed using the IGRF 1965.0 or IGRF 1975.0 (see section 5.4).

7.2 Special Plots - Mercator projection plots can be generated with chart scales and parameters for printing or profiling magnetic and

depth values different from those provided as standard output. A document, "User's Guide for Depth, Magnetic and Track Plotting Programs for the CDC 3600 Computer", which describes the detailed input specifications, is available from the GDC.

Track plots and compilation plots (depth, magnetic or gravity values printed, not profiled, along the track) can also be made from the non-SIO data in the NGDC "merge-merge" format.

7.3 S.I.O. Sample Index - The SIO Sample Index is a listing that contains the beginning and end times and positions of all underway records and other geological, biological and physical oceanographic samples collected on SIO cruises. The index contains no results, but a disposition code indicates who to contact for further information about a particular item. Contact the Geological Data Center for details.

8.0 DIGITAL DATA FORMATS

The tape format used for storing depth and magnetic data in the SIO underway data base is highly machine and installation dependent and was designed specifically for optimum storage and retrieval on the CDC 3600 computer located at the UCSD Computer Center. Over the past few years, several alternative formats have been devised to transmit data to government agencies and other institutions. Because it is not feasible to re-process all the data into a single exchange format, a given cruise may exist in one or more of the exchange formats, depending on the age of the cruise and when it was processed. These exchange formats are outlined below and described in the appendices. Contact GDC about which formats are available for a specific cruise.

8.1 Card Formats - in time series (not recommended for large volume data transfers).

8.1.1 Cruises prior to 1969 are in miscellaneous x-y digitizer formats.

8.1.2 Post-1969 Cruises

"SIO2 Navigation Format (see Appendix I)

"SIO2 Depth and Magnetics" Format (see Appendix II).

8.2 Tape Formats

8.2.1 Time Series - available for all cruises processed through 1975.

8.2.1.1 "Time in Accumulated minutes vs. Navigation" Format (see Appendix III).

8.2.1.2 "Time in Accumulated minutes vs. Depth or Magnetic Total Field" (see Appendix IV).

8.2.2 "NAS Navigation" Format - the standard National Geophysical Data Center format, with time in hour, minute, day, month and year. Available for cruises after 1972 (see Appendix V).

8.2.3 Merge Formats - time and position vs. depth and/or magnetics.

8.2.3.1 "NGDC Merge-Merge" Format. The standard NGDC merge format, combining time, position, course, speed, depth, magnetics and gravity. Available for cruises after 1972 (see Appendix VI).

8.2.3.2 "SIO Modified Merge" Format. Time, position and one of three variables of depth, magnetic total field or magnetic anomaly. Developed to send SIO "historical" (pre-1973) data to NGDC. Will not be maintained for post-1972 data (see Appendix VII).

Note: As of April 1978, the new exchange format sponsored by NGDC, identified as "MGD77" has not been implemented at Scripps.

9.0 ACKNOWLEDGMENTS

As in past years, we wish to thank the Shipboard Computer Group, headed by J.L. Abbott, for help in acquiring the navigation and magnetic data at sea. The Resident Marine Technician Group, under J.L. Coatsworth, coordinated the watchstanding and record keeping at sea with the chief scientists and saw that the data reached SIO safely at the end of each cruise leg. We also thank the chief scientists, many of whom had little direct interest in the underway data, and the many members of the scientific parties for keypunching the depths.

The operations of the Geological Data Center are funded principally by the Scripps Industrial Associates, a group of companies that provides continuing support for geological research. Support was also received from the Office of Naval Research for general data management (contract N-00014-75-C-0152) and through day rate charges for data center services from a number of ONR and National Science Foundation grants.


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*****
*                               *
*      S.I.O.  CRUISES         *
*                               *
*  WITH UNDERWAY DATA       *
*                               *
* (DEPTH, MAGNETICS, )       *
* (SJBOTTOM PROFILER)       *
* ( AND GRAVITY )           *
*                               *
*****

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*** VERSION AS OF APRIL 1978 ***

COMPILED BY

GEOLOGICAL DATA CENTER

SCRIPPS INSTITUTION
OF OCEANOGRAPHY
LA JOLLA, CA. 92093

SYMBOL KEY

+ DIGITIZING DONE OR RECORDS AT DATA CENTER
 O NOT DONE OR NOT ARCHIVED
 / PART DONE OR PART HERE
 M RECORDS OR NAVIGATION ON MICROFILM
 - NOT GOING TO BE DONE
 (BLANK) STATUS UNKNOWN
 E EDO DEPTH RECORD (PRE-1958 CRUISES)
 P PRECISION DEPTH RECORD (PDR,GDR)
 (S.I.) SAMPLE INDEX AVAILABLE
 * SENT TO NATIONAL GEOPHYSICAL DATA CENTER

NOTES

- 1) THIS LIST CONTAINS ALL SIO CRUISES KNOWN TO HAVE COLLECTED UNDERWAY DATA.
PLEASE BRING ERRORS OR OMISSIONS TO OUR ATTENTION.
- 2) CONTACT THE GEOLOGICAL DATA CENTER, ROOM 1314 OLD RITTER HALL, PHONE (714)452-2752, REGARDING ORIGINAL DEPTH, MAGNETIC AND PROFILER RECORDS, INDEX PLOTS, MICROFILMS, REPRODUCTIONS OF PROFILER RECORDS, DIGITAL DATA AND PROCESSING, INFORMAL CRUISE REPORTS, (FOR CRUISES AFTER 1971) AND COMPUTER GENERATED PLOTS.
- 3) GRAVITY DATA ARE COLLECTED AND SELECTIVELY PROCESSED UNDER DIRECTION OF L.M. DORMAN (PHONE 452-2406). (STATUS OF GRAVITY SHOWN ONLY FOR POST-1971 CRUISES.)
- 4) DATA FROM THE DEEPSEA DRILLING PROJECT CRUISE OF D/V GLOMAR CHALLENGER ARE PROCESSED BY THE DATA CENTER AND ARCHIVED AT DSDP, SIO (CONTACT B. LONG, ROOM 8, DSDP BUILDING, PHONE 452-3506).
- 5) CRUISE LEGS WITH DIGITAL DATA HAVE 8 CHARACTER IDENTIFIER.
CRUISE ABBREV.=4 CHAR.,LEG=2 CHAR.,SHIP ABBREV.=2 CHAR.
SINGLE LEG CRUISES HAVE LEG IDENTIFIER OF '-1' INSTEAD OF '01'.

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG SUB GRAV						BEGIN DATE	END DATE	
		D 1 D		D 3 P		P				
		P I	2 I	I	. R	R	R			
		L G	G	R G	5 0	R 0	R 0			
		Q I	K I	E I	K F	F C	C S			
		T T	H T	C T	H L	C S				
040	ACAPULCO TRENCH-BAIRD(SEE 046)									
092	ACAPULCO GEOLOGICAL EXPED (AGE)	+	P	0	0	-	0	0	11SEP56 8NOV56	
119	AGASSIZ 69/06/1	0	0	0	0	0	+	M	19JUN69 29JUN69	
011	AMPHITRITE-ARGO									
	AMPHOLAR SAN DIEGO-PAPEETE,TAHI.	+	++	M	++	+	++	0	0	03DEC63 06JAN64
	AMPHO2AR PAPEETE-PAGO PAGO,SAMOA	+	++	P	++	+	++	0	0	09JAN64 23JAN64
	AMPHO3AR PAGO PAGO-SAN DIEGO	+	++	P	++	+	++	0	0	27JAN64 29FEB64
125	ANTIPODE-MELVILLE (S.I.) FOR LEGS 16 AND 17 ONLY									
	ANTIP01MV SAN DIEGO-SAN FRANCISCO	+	++	P	0	+	++	+	M	16JUN70 29JUN70
	ANTIP02MV SAN FRANCISCO-ADAK,ALA.	+	++	P	++	+	++	+	M	03JUL70 22JUL70
	ANTIP03MV ADAK,ALASKA-TOKYO,JAPAN	+	++	P	++	+	++	+	M	25JUL70 20AUG70
	ANTIP04MV TOKYO,JAPAN-MANILA	+	++	0	++	+	++	M	M	28AUG70 18SEP70
	ANTIP05MV MANILA-MURITIUS	+	++	P	++	+	++	+	M	24SEP70 17OCT70
	ANTIP06MV MAURITIUS-MAURITIUS	+	+	P	0	+	+	+	+	26OCT70 24NOV70
	ANTIP07MV MAURITIUS-MAURITIUS	+	+	P	0	+	+	+	+	27NOV70 16DEC70
	ANTIP08MV MAURITIUS-MOMBASA	+	+	P	0	+	+	+	+	07JAN71 16FEB71
	ANTIP09MV MOMBASA-MOMBASA	+	++	0	++	+	++	+	M	21FEB71 15MAR71
	ANTIP10MV MOMBASA-COLOMBO	+	++	P	++	+	++	+	M	18MAR71 04APR71
	ANTIP11MV COLOMBO-PADANG	+	++	0	++	+	++	+	M	15APR71 02MAY71
	ANTIP12MV PADANG-SINGAPORE	+	++	0	++	+	++	+	M	26MAY71 17JUN71
	ANTIP13MV SINGAPORE-GUAM	+	++	0	++	+	++	M	M	25JUN71 16JUL71
	ANTIP14MV GUAM-PAGO PAGO	+	++	0	++	+	++	+	M	27JUL71 08AUG71
	ANTIP15MV PAGO PAGO-TONGA	0	0	P	+	0	0	+	0	13AUG71 24AUG71
	ANTIP16MV TONGA-PAGO PAGO	+	++	P	++	+	++	+	M	26AUG71 09SEP71
	ANTIP17MV PAGO PAGO-SAN DIEGO	+	++	0	++	+	++	M	M	11SEP71 03OCT71
112	APHRODITE - E.B.SCRIPPS									
	APRO-1EB	+	++	P	++	+	++	0	0	14JUL68 20JUL68
041	ARGO SHAKEDOWN	+	0	P	0	+	0	0	+	21JUL61 01AUG61
166	ARGO 3-65-ARGO	+	0	P	0	0	0	0	+	03MAR70 05APR70
160	ARGUELLO-BAIRD	+	0	0	0	0	0	0	+	16MAR57 26MAR57
129	ARIES-T.WASHINGTON									
	ARES1AWT SAN DIEGO-EASTER IS.	+	++	P	++	+	++	+	M	15NOV70 02DEC70
	ARES1BWT EASTER IS.-PAPEETE	+	++	P	++	+	++	+	M	04DEC70 22DEC70
	ARES1CWT PAPEETE-WELLINGTON,N.Z.	+	++	P	++	+	++	+	0	26DEC70 04JAN71
	ARES02WT WELLINGTON-WELLINGTON	0	++	P	++	+	++	+	M	07JAN71 21FEB71
	ARES03WT WELLINGTON-TAHITI	0	+	/	0	/	0	+	+	01MAR71 27MAR71
	ARES04WT TAHITI-HONOLULU	0	++	P	++	+	++	+	0	01APR71 29APR71
	ARES05WT HONOLULU-TOKYO,JAPAN	0	++	P	++	+	++	+	M	06MAY71 06JUN71
	ARES06WT TOKYO-YOKOHAMA,JAPAN	0	++	P	++	+	++	+	0	12JUN71 27JUL71
	ARES07WT YOKOHAMA,JAPAN-HONOLULU	+	++	P	++	+	++	+	M	27JUL71 30AUG71
	ARES08WT HONOLULU-HONOLULU	+	0	P	0	+	0	+	0	04SEP71 19SEP71
	ARES09WT HONOLULU-SAN DIEGO	+	0	0	0	+	0	0	0	22SEP71 14OCT71
136	BAJA 69-OCNOSTOTA									
	BJ69-10T	0	+			++	0	+		08FEB69 FEB69
094	BAJA SLOPE-BAIRD	0	0	P	0	0	-	0	0	28APR61 07MAY61
137	BENTHYFACE-MELVILLE (S.I.)									
	BNFC01MV SAN DIEGO-MANZANILLO	+	++	P	++	+	++	0	0	0 0 21MAY73 03JUN73
	BNFC02MV MANZANILLO-SAN DIEGO	+	++	P	++	+	++	0	M	0 0 06JUN73 07JUL73

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG SUB GRAV						BEGIN DATE	END DATE
		D	1 D	D	3 P	P			
		P I	2 I	I	. R	R			
		L G	G	R G	5 O	R O			
		O I	K I	E I	K F	E C			
		T T	H T	C T	H L	C S			
045	BILLABONG-ALPHA HELIX	+ 0	0 0	0 0	0 0			19MAR66	22NOV66
085	BLUE FLASH-H M SMITH	+ 0	P 0	0 -	0 M			13MAY63	23MAY63
145	BODEGA -BAIRD				M			17NOV63	25NOV63
152	BOMDROP(MN7503KK)-KANA KEOKI (S.I.)								
	MN7503KK HONOLULU-HONOLULU	+ **	0 0*	0 0*	+ 0	0 0		21NOV75	9DEC75
043	BONACCA-BAIRD	+ 0	P 0	0 -	0 M			26JUL63	13SEP63
163	BONGO TWO-MELVILLE	+ 0	0 0	0 0	0 +			25MAR70	29MAR70
037	CAPRICORN-BAIRD	+ 0	E -	0 -	0 0			27OCT52	21FEB53
044	CAPRICORN-HORIZON								
	CAPH-AHO	+ +	E -	+ 0	0 0			26SEP52	07DEC52
	CAPH-BHO	+ **	E -	+ **	0 0			04JAN53	23JAN53
	CAPH-CHO	+ **	E -	+ **	0 0			26JAN53	20FEB53
023	CARROUSEL-BAIRD								
	CAKRO1BD SAN DIEGO-VALPARAISO, CH	+ **	M **	+ **	0 +			13JUN64	14JUL64
	CAKRO2BD VALPARAISO-SAN DIEGO	+ **	M **	+ **	0 +			20JUL64	18AUG64
101	CASCADIA	+ 0	E -	0 -	0 0			15SEP52	25SEP52
133	CATO-MELVILLE (S.I.)								
	CAT001MV SAN DIEGO-HONOLULU, HAWA	+ **	M **	+ **	0 0	0 0		07JUN72	05JUL72
	CAT002MV HONOLULU-PAPEETE, TAHITI	+ **	M **	+ **	0 0	0 0		10JUL72	10AUG72
	CAT003MV PAPEETE-PAPEETE, TAHITI	+ **	M **	+ **	M M	0 0		14AUG72	08SEP72
	CAT004MV PAPEETE-VALPARAISO, CHIL	+ **	M **	+ **	M M	0 0		13SEP72	04OCT72
	CAT005MV VALPARAISO-RIO, BRAZIL	+ **	M **	+ **	M M	0 0		11OCT72	03NOV72
	CAT006MV RIO, BRAZIL-RIO, BRAZIL	+ **	M **	+ **	M M	0 0		07NOV72	16DEC72
	CAT007MV RIO, BRA-CRISTOBAL, C.Z.	+ **	M **	+ **	M M	0 0		20DEC72	13JAN73
	CAT008MV BALBOA, C.Z.-SAN DIEGO	+ **	M **	+ **	M M	0 0		19JAN73	14FEB73
102	CEBROS DEEP-BAIRD		E 0	0 -	0 0			21JUL52	01AUG52
146	CHANEEL-OCONOSTOTA								
	CHNL010T SAN DIEGO-EUREKA				M			22AUG68	25AUG68
	CHNL020T EUREKA-SAN FRANCISCO				M			26AUG68	27AUG68
	CHNL030T SAN FRANCISCO-SAN FRAN		+ 0					28AUG68	6SEP68
	CHNL040T SAN FRANCISCO-SAN DIEGO		+ 0		M			18SEP68	25SEP68
020	CHINOOK-BAIRD								
	CHIN01BD SAN DIEGO-ADAK, ALASKA	** P	/ *		0 0			29JUN56	22JUL56
	(DIGITAL DEPTH TAPE ID='CHIN-A')								
	CHIN02BD ADAK-HONOLULU		P		0 0			25JUL56	12AUG56
	CHIN03BD HONOLULU-SAN DIEGO	** P	/ *		0 0			14AUG56	23AUG56
	(DIGITAL DEPTH TAPE ID='CHIN-B')								
019	CHINOOK-STRANGER								
	CHIN-1ST SAN DIEGO-HONOLULU	** P	/ *					29JUN56	12AUG56
046	CHUBASCO-BAIRD		E -	0 -	0 0			12OCT54	20DEC54
047	CHUBASCO-HORIZON		E -	0 -	0 0			9NOV54	20DEC54
048	CIRCE-ARGO								
	CIRC01AR SAN DIEGO-HONOLULU	+		+	+ M			07MAR68	17MAR68
	CIRC02AR HONOLULU-PENANG	+ **	P **	+ **	+ M			31MAR68	29APR68
	CIRC03AR PENANG-COLOMBO	+		+ **	M			03MAY68	02JUN68
	CIRC04AR COLOMBO-COLOMBO	+		+ **	M			06JUN68	28JUN68
	CIRC05AR COLOMBO-MAURITIUS	+	+ **	+ **	M			02JUL68	31JUL68
	CIRC06AR MAURITIUS-MAURITIUS	+		+ **				04AUG68	01SEP68

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG SUB GRAV										BEGIN DATE	END DATE
		D	1	D	3	P	P						
		P	I	I	I	R	R						
		L	G	R	G	5	R						
		O	I	E	I	K	F						
T	T	H	T	C	T	H	L	C	S				
	CIRC07AR MAURITIUS-LOURENCO, MARQ	+				+	++					05 SEP68	03 OCT68
	CIRC08AR LOURENCO, MARQUES-LUANDA	+	++	P	++	+	++	+	M			09 OCT68	05 NOV68
	CIRC09AR LUANDA-FORTALEZA	+	++	P	++	+	++	+	M			09 NOV68	03 DEC68
	CIRC10AR FORTALEZA-CRISTOBAL								M			06 DEC68	23 DEC68
	CIRC11AR CRISTOBAL-CRISTOBAL								M			03 JAN69	18 JAN69
	CIRC12AR CRISTOBAL-SAN DIEGO					+			M			19 JAN69	30 JAN69
144	CUCOTOW-MELVILLE (S.I.)												
	CCTW-TMV SAN DIEGO-SAN DIEGO	0	++	M	0	0	0	M	M	0	0	19 AUG74	22 AUG74
	CCTW01MV SAN DIEGO-ACAPULCO	+	++	P	++	+	++	M	0	0	0	26 AUG74	20 SEP74
	CCTW02MV ACAPULCO-BALBOA, C.Z.	+	++	P	++	+	++	M	M	0	0	25 SEP74	18 OCT74
	CCTW03MV BALBOA-BALBOA, C.Z.	+	++	P	++	+	++	+	M	0	0	22 OCT74	16 NOV74
	CCTW04MV BALBOA-SAN DIEGO	+	++	M	++	+	++	M	M	0	0	20 NOV74	18 DEC74
049	COSTA RICA DOME-BAIRD	+	0	P	0	0	-	0	0			6 NOV59	7 DEC59
025	CRISSCROSS-BAIRD												
	CRCS01SB SAN DIEGO-BALBOA, C.Z.	+	++	P	++	+	++	0	0			21 FEB63	10 MAR63
	CRCS02SB BALBOA-PUNTARENAS	+	++	P	++	+	++	0	0			13 MAR63	01 APR63
	CRCS03SB PUNTARENAS-SAN DIEGO	+	++	P	/	+	++	0	0			04 APR63	19 FEB63
126	CRUNCH-CONOSTOTA												
	CRUN-10T SAN DIEGO-SAN DIEGO	+	++	+	++	+	++	0	0			28 JUL69	1 AUG69
050	CUSP-BAIRD			E	-	0	-	0	0			21 JUL56	16 AUG56
051	CUSP-HORIZON			E	-	0	-	0	0			21 JUL56	15 AUG56
124	DEEP SEA DRILLING PROJECT - GLOMAR CHALLENGER (S.I.)											22 TO PRESENT	
	LEGS												
	DSDP01GC ORANGE, TEX.-HOBOKEN, N.J.	0	0	0	0	0	0	0	0			11 AUG68	23 SEP68
	DSDP02GC HOBOKEN-DAKAR, SENEGAL	0	0	P	0	+		0	+			01 OCT68	24 NOV68
	DSDP03GC DAKAR-RIO, BRAZIL	+	+	0	0	0	0	0	0			01 DEC68	25 JAN69
	DSDP04GC RIO-SAN CRISTOBAL, PAN.	+	+	M	0	M	0	0	M			27 JAN69	24 MAR69
	DSDP05GC SAN DIEGO-HONOLULU	+	+	M	0	M	0	0	M			12 APR69	05 JUN69
	DSDP06GC HONOLULU-APRA, GUAM	+	+	M	0	M	0	0	M			11 JUN69	05 AUG69
	DSDP07GC APRA, GUAM-HONOLULU	+	++	M	/	*	M	/	0	M		08 AUG69	02 OCT69
	DSDP08GC HONOLULU-PAPEETE, TAHITI	+	++	M	/	*	M	/	0	M		08 OCT69	02 DEC69
	DSDP09GC PAPEETE-BALBOA, PANAMA	+	++	M	/	*	M	/	0	M		06 DEC69	27 JAN70
	DSDP10GC GALVESTON, TEX.-MIAMI	+	+	M	0	M	0	0	M			13 FEB70	05 APR70
	DSDP11GC MIAMI-HOBOKEN, N.J.	+	+	M	0	M	0	0	M			08 APR70	01 JUN70
	DSDP12GC BOSTON, MAS.-LISBON, PORT	+	+	M	0	M	++	0	M			19 JUN70	11 AUG70
	DSDP13GC LISBON-LISBON, PORTUGAL	+	+	M	++	M	++	0	M			13 AUG70	06 OCT70
	DSDP14GC LISBON-SAN JUAN, P.R.	+	+	M	++	M	++	0	M			09 OCT70	30 NOV70
	DSDP15GC SAN JUAN, P.R.-CRISTOBAL	+	++	M	++	M	++	0	M			05 DEC70	02 FEB71
	DSDP16GC CRISTOBAL, PAN.-HONOLULU	+	++	M	++	M	++	0	M			02 FEB71	30 MAR71
	DSDP17GC HONOLULU-HONOLULU	+	++	M	++	M	++	0	M			30 MAR71	25 MAY71
	DSDP18GC HONOLULU-KODIAC, ALASKA	+	++	M	++	+	++	0	M			29 MAY71	20 JUL71
	DSDP19GC KODIAC-YOKAHAMA, JAPAN	+	++	M	++	M	++	0	M			22 JUL71	09 SEP71
	DSDP20GC YOKAHAMA-SUVA, FIJI	+	++	M	++	M	++	0	M			17 SEP71	10 NOV71
	DSDP21GC SUVA, FIJI-DARWIN, AUS.	+	++	M	++	M	++	0	M	0	0	09 NOV71	11 JAN72
	DSDP22GC DARWIN, AUST-COLOMBO, CEY	+	++	M	++	M	++	0	M	0	0	14 JAN72	05 MAR72
	DSDP23GC COLOMBO-FR. SOMALILAND	+	++	M	++	M	++	0	M	0	0	08 MAR72	12 APR72
	DSDP24GC FR. SOMALILAND-MURITIUS	+	++	M	++	+	++	0	M	0	0	03 MAY72	26 JUN72
	DSDP25GC MAURITIUS-DURBAN, AFRICA	+	++	M	++	M	++	0	M	0	0	28 JUN72	22 AUG72
	DSDP26GC DURBAN, S.A.-PERTH, AUST	+	++	M	++	+	++	0	M	0	0	06 SEP72	29 OCT72

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		O	1	D	D	3	P						
		P	I	2	I	I	.	R					
		L	G	G	R	G	5	O	R	O			
		O	I	K	I	E	I	K	F	E	C		
		T	T	H	T	C	T	H	L	C	S		
DSDP27GC	FREMANTLE-FREMANTLE, AUS	+	+	+	+	+	+	+	+	+	+	01NOV72	08DEC72
DSDP28GC	FREMANTLE-CHRISTCHURCH	+	+	+	+	+	+	+	+	+	+	20DEC72	26FEB73
DSDP29GC	LYTTLETON, N.Z.-WELLNGTN	+	+	+	+	+	+	+	+	+	+	02MAR73	17APR73
DSDP30GC	WELLNGTN, N.Z.-APRA, GUAM	+	+	+	+	+	+	+	+	+	+	24APR73	12JUN73
DSDP31GC	APRA, GUAM-HOKODATE, JAP.	+	+	+	+	+	+	+	+	+	+	15JUN73	04AUG73
DSDP32GC	HOKODATE-HONOLULU	+	+	+	+	+	+	+	+	+	+	15AUG73	11OCT73
DSDP33GC	HONOLULU-PAPEETE, TAHITI	+	+	+	+	+	+	+	+	+	+	03NOV73	17DEC73
DSDP34GC	PAPEETE-CALLAO, PERU	+	+	+	+	+	+	+	+	+	+	20DEC73	02FEB74
DSDP35GC	CALLAO, PERU-USHUAIA, ARG.	+	+	+	+	+	+	+	+	+	+	13FEB74	29MAR74
DSDP36GC	USHUAIA, ARG.-RIO, BRAZIL	+	+	+	+	+	+	+	+	+	+	04APR74	22MAY74
DSDP37GC	RIO-DUBLIN, IRELAND	+	+	+	+	+	+	+	+	+	+	30MAY74	30JUL74
DSDP38GC	DUBLIN-AMSTERDAM, NETH.	+	+	+	+	+	+	+	+	+	+	02AUG74	26SEP74
DSDP39GC	AMSTERDAM-CAPE TOWN	+	+	+	+	+	+	+	+	+	+	09OCT74	16DEC74
DSDP40GC	CAPE TOWN-ABIDJAN, I.C.	+	+	+	+	+	+	+	+	+	+	19DEC74	24FEB75
DSDP41GC	ABIDJAN-MALAGA, SPAIN	+	+	+	+	+	+	+	+	+	+	17FEB75	10APR75
DSDP42GC	MALAGA-ISTANBUL, TURK.	+	+	+	+	+	+	+	+	+	+	14APR75	10JUN75
DSDP43GC	ISTANBUL-NORFOLK, VIR.	+	+	+	+	+	+	+	+	+	+	11JUN75	12AUG75
DSDP44GC	NORFOLK-NORFOLK, VIR.	+	+	+	+	+	+	+	+	+	+	16AUG75	29SEP75
DSD44AGC	NORFOLK-SAN JUAN, P.R.	+	+	+	+	+	+	+	+	+	+	08NOV75	27NOV75
DSDP45GC	SAN JUAN-SAN JUAN, P.R.	+	+	+	+	+	+	+	+	+	+	30NOV75	20JAN76
DSDP46GC	SAN JUAN-CANARY ISLANDS	+	+	+	+	+	+	+	+	+	+	28JAN76	10MAR76
DSDP47GC	CANARY IS.-BREST, FRANCE	+	+	+	+	+	+	+	+	+	+	20MAR76	11MAY76
DSDP48GC	BREST-ABERDEEN, SCOT.	+	+	+	+	+	+	+	+	+	+	22MAY76	13JUL76
DSDP49GC	ABERDEEN-FUNCHAL, MAD.	+	+	+	+	+	+	+	+	+	+	18JUL76	04SEP76
DSDP50GC	FUNCHAL-FUNCHAL, MADEIRA	+	+	+	+	+	+	+	+	+	+	11SEP76	10NOV76
DSDP51GC	FUNCHAL-SAN JUAN	+	+	+	+	+	+	+	+	+	+	11NOV76	17JAN77
DSDP52GC	SAN JUAN-SAN JUAN, P.R.	+	+	+	+	+	+	+	+	+	+	29JAN77	9MAR77
DSDP53GC	SAN JUAN-CRISTOBAL, PAN.	+	+	+	+	+	+	+	+	+	+	03MAR77	25APR77
DSDP54GC	CRISTOBAL-LOS ANGELES	+	+	+	+	+	+	+	+	+	+	29APR77	18JUN77
DSDP55GC	LOS ANGELES-YOKOHAMA	+	+	+	+	+	+	+	+	+	+	13JUL77	5SEP77
DSDP56GC	YOKOHAMA-TOKYO	+	+	+	+	+	+	+	+	+	+	10SEP77	10OCT77
DSDP57GC	TOKYO-YOKOHAMA	+	+	+	+	+	+	+	+	+	+	16OCT77	04DEC77
DSDP58GC	YOKOHAMA-OKINAWA	+	+	+	+	+	+	+	+	+	+	11DEC77	30JAN78
DSDP59GC	OKINAWA-GUAM	+	+	+	+	+	+	+	+	+	+	3FEB78	15MAR78
DSDP60GC	GUAM-GUAM											21MAR78	16MAY78
(CRUISE IN PROGRESS)													
DSDP61GC	GUAM-MAJURO											22MAY78	6JUL78
DSDP62GC	MAJURO-SEATTLE											8JUL78	4SEP78
DSDP63GC	SEATTLE-MANZANILLO											12SEP78	3NOV78
DSDP64GC	MANZANILLO-MAZATLAN											8NOV78	27DEC78
DSDP65GC	MAZATLAN-MANZANILLO											2JAN79	21FEB79
DSDP66GC	MANZANILLO-MANZANILLO											26FEB79	18APR79
DSDP67GC	MANZANILLO-SAN JOSE											23APR79	11JUN79
DSDP68GC	SAN JOSE-GUAYAQUIL											16JUN79	5AUG79
DSDP69GC	GUAYAQUIL-BALBOA											10AUG79	28SEP79
153	DEEPSONDE-T. WASHINGTON (S.I.)												
	DPSN01WT SAN DIEGO-SAN DIEGO	+	+	P	+	+	+	M	M	+	+	10JAN76	01FEB76
	DPSN02WT SAN DIEGO-SAN DIEGO	+	+	P	+	+	+	M	M	+	+	09FEB76	02MAR76

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		D	1	D	D	3	P				
		P	I	2	I	I	R				
		L	G	G	R	G	5				
		O	I	K	I	E	I				
T	T	H	T	C	T	H	L	C	S		
142	DELONEER-OCUNOSTOTA										
	DELO-10T SAN DIEGO-SAN DIEGO	0	+	M	++	0	-	0	0	18SEP72 26SEP72	
029	DODU-ARGO										
	DOD001AR SAN DIEGO-HONOLULU			P	0	+	0	0	0	08APR64 28APR64	
	DOD002AR HONOLULU-HONOLULU			P	0	+	0	0	0	30APR64 08MAY64	
	DOD003AR HONOLULU-KWAJALEIN			P	0	+	0	0	0	10MAY64 27MAY64	
	DOD004AR KWAJALEIN-DARWIN				0	+	0	0	0	29MAY64 11JUN64	
	DOD005AR DARWIN-AURITIUS	+		0	+	++	0	0	0	15JUN64 13JUL64	
	DOD006AR AURITIUS-MOMBASA	0		0	+	0	0	0	0	16JUL64 30JUL64	
	DOD007AR MOMBASA-AURITIUS	0		0	0	0	0	0	0	04AUG64 07SEP64	
	DOD008AR AURITIUS-COLOMBO	+		++	+	++	0	0	0	10SEP64 10OCT64	
	DOD009AR COLOMBO-SINGAPORE	+		0	+	++	0	0	0	13OCT64 03NOV64	
	DOD010AR SINGAPORE-MANILA			0	0	0	0	0	0	06NOV64 20NOV64	
	DOD011AR MANILA-GUAM			0	+	0	0	0	0	22NOV64 01DEC64	
	DOD012AR GUAM-SAN DIEGO			P	0	+	0	0	0	03DEC64 23DEC64	
052	DOLDRUMS-BAIRD	+		P	0	0	-	0	0	03AUG58 30SEP58	
030	DOLDRUMS-HORIZON										
	DLDR01HO SAN DIEGO-BALBOA,C.Z.	+	++	M		+	++	0	+	01AUG58 02SEP58	
	DLDR02HO BALBOA-SAN DIEGO	+	++	M		+	++	0	+	07SEP58 30SEP58	
053	DOLDRUMS-STRANGER	+		E	-	0	-	0	0	01AUG58 30SEP58	
002	DOLPHIN-HORIZON										
	DOLP01HO	+	++	P	/	*	0	0	0	28MAR58 01MAY58	
	(DIGITAL DEPTH TAPE ID='DOLP-A')										
	DOLP02HO	+	++	M	/	*	+	++	0	05MAY58 09JUN58	
	(DIGITAL DEPTH TAPE ID='DOLP-B')										
054	DORADO-HORIZON	+	0	P	0	0	-	0	0	7JUL59 20AUG59	
010	DOWNWIND-SPENCER BAIRD										
	DNWB-ABD SAN DIEGO-PAPEETE	+	++	P	++	0	-	0	0	21OCT57 15NOV57	
	DNWB-BBD PAPEETE-VALPARAISO,CH.	+	++	P	++	0	-	0	0	19NOV57 21DEC57	
	DNWB-CBD VALPARAISO-CALLAO,PERU	+	++	P	++	0	-	0	0	28DEC57 15JAN58	
	DNWB-DBD CALLAO-SAN DIEGO	+	++	P	++	0	-	0	0	18JAN58 01MAR58	
009	DOWNWIND-HORIZON										
	DNWH-AHO SAN DIEGO-PAPEETE	+	/	*	P	/	*	0	-	21OCT57 15NOV57	
	DNWH-BHO PAPEETE-VALPARAISO,CH.	+	0	P	0	0	-	0	0	19NOV57 23DEC57	
	DNWH-CHO VALPARAISO-CALLAO,PERU	+	0	P	0	0	-	0	0	29DEC57 15JAN58	
	DNWH-DHO CALLAO-SAN DIEGO	+	/	*	P	/	*	0	-	21JAN58 28FEB58	
100	EASTROPAC-M-WASHINGTON	0	0	P	0	0	-	0	0		
055	EASTROPIC-BAIRD	+	0	E	-	0	-	0	0	OCT55 DEC55	
056	EASTROPIC-HORIZON	+	0	E	-	0	-	0	0	30OCT55 14DEC55	
170	EPLL(EAST PACIFIC LONGLINE)- THOMAS										
	EPLL-1WT SAN DIEGO-SAN DIEGO	+	+	P	+	+	+	+	+	11OCT77 03NOV77	
104	EQUAPAC-STRANGER			E	-	0	-	0	0	20AUG56 04OCT56	
149	EQUAPAC-HORIZON									AUG56 SEP56	
141	EURYDICE-T WASHINGTON (S.I.)										
	ERDC01WT SAN DIEGO-HONOLULU	+	++	M	++	+	++	M	M	+	04SEP74 16SEP74
	ERDC02WT HONOLULU-PAGO PAGO	+	++	M	++	+	++	M	M	+	20SEP74 30OCT74
	ERDC03WT PAGO PAGO-NOUMEA	+	++	M	+	+	+	M	M	+	04NOV74 30NOV74
	ERDC04WT NOUMEA-SINGAPORE	+	++	M	++	+	++	M	M	0	05DEC74 22DEC74

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG SUB GRAV						BEGIN DATE	END DATE
		D	1 D	D	3 P	P			
		P I	2 I	I	. R	R			
		L G	G	R G	5 O	R O			
		O I	K I	E I	K F	E C			
		T T	H T	C T	H L	C S			
	ERDC05WT SINGAPORE-SURABAYA	+	++	0	+	+	+	30DEC74	08FEB75
	ERDC06WT SURABAYA-CEBU, PHILIPP.	+	++	0	++	+	++	12FEB75	18FEB75
	ERDC07WT CEBU-GUAM	+	++	P	++	+	++	21FEB75	20MAR75
	ERDC08WT GUAM-GUAM	+	++	P	0	+	+	24MAR75	01APR75
	ERDC09WT GUAM-MAJURO	+	++	P	++	+	++	03APR75	05MAY75
	ERDC10WT MAJURO-MAJURO	+	++	P	++	+	++	10MAY75	13JUN75
	ERDC11WT MAJURO-SAN DIEGO	+	++	P	++	+	++	20JUN75	18JUL75
168	EXITO-OCNOSTOTA								
	XITO-10T SAN DIEGO-SAN DIEGO	+	0	+	0	0	0	04MAR73	06APR73
	XITO-20T SAN DIEGO-SAN DIEGO	+	0	+	0	0	0	01MAY73	28MAY73
086	EXJIBIA-T. WASHINGTON	0	0	P	0	0	-	16JUL66	10AUG66
035	FANFARE-BAIRD	+	0	P	U	+	0	9JUL59	20JUL59
099	FANFARE-SMITH			P				06JUL59	26JUL59
171	FARALLON BASIN SURVEY-AGASSIZ								
	FAKA-1AZ SAN DIEGO-SAN DIEGO	+	0	+	0	0	0	01OCT74	05NOV74
087	FLIP-HORIZON	0	0	P	0	0	-	24AUG63	70CT63
089	FLORA II-HORIZON	+		P	0	0	-		
148	FRANCIS DRAKE-MELVILLE (S.I.)								
	FDRK01MV SAN DIEGO-USHUAIA, ARG.	+	++	0	++	+	++	20JAN75	14FEB75
	FDRK02MV USHUAIA-USHUAIA, ARG.	+	++	M	++	0	0*	19FEB75	23APR75
	FDRK03MV USHUAIA-BALBOA, C.Z.	+	++	M	++	M	++	05APR75	10MAY75
	FDRK04MV BALBOA-MANZANILLO, MEX.	+	++	P	++	+	++	14MAY75	21MAY75
	FDRK05MV MANZANILLO-SAN DIEGO	+	++	+	++	+	++	24MAY75	12JUN75
158	FORAKE 77-MELVILLE (S.I.)								
	FD7701MV SAN DIEGO-VALPARAISO	+	+	+	+	+	+	15DEC76	01JAN77
	FD7702MV VALPARAISO-P. ARENAS	+	+	M	+	M	+	10JAN77	12FEB77
	FD7703MV P. ARENAS-SAN MARTIN	+	+	0	0	M	+	16FEB77	28FEB77
	FD774AMV SAN MARTIN-CALLAO	+	+	P	+	0	0	03MAR77	09MAR77
	FD774BMV CALLAO-CALLAO	+	+	P	+	+	+	11MAR77	30MAR77
	FD774CMV CALLAO-CALLAO	+	+	0	0	0	0	02APR77	25APR77
	FD774DMV CALLAO-BALBOA	+	+	+	+	+	+	03MAY77	27MAY77
	(THERE IS NO LEG 5)								
	FD7706MV BALBOA-ACAPULCO	+	+	+	+	+	+	30MAY77	29JUN77
	FD7707MV ACAPULCO-SAN DIEGO	+	+	+	+	+	+	30JUN77	09JUL77
082	GAM-E.B. SCRIPPS								
	GAM--1EB	+	++	P	++	+	++	01NOV67	13NOV67
083	GAM II-E.B. SCRIPPS								
	GAM2-1EB	+	++	P	++	+	++	06FEB68	26FEB68
115	GAMBUL-E.B. SCRIPPS								
	GMBL01EB SAN DIEGO-SAN DIEGO	+	++	P	++	+	++	02OCT68	14OCT68
	GMBL02EB SAN DIEGO-SAN DIEGO	+	++	P	++	+	++	16OCT68	01NOV68
118	GAMETE-AGASSIZ								
	GMET-1AZ	+	++	P	0	+	++	MAR69	
139	GENISECS-MELVILLE (S.I.)								
	GECS-AMV SAN DIEGO-HONOLULU	+	++	P	++	+	++	23AUG73	10SEP73
	GECS-BMV HONOLULU-ADAK, ALASKA	+	++	P	++	+	++	16SEP73	06OCT73
	GECS-CMV ADAK-TOKYO, JAPAN	+	++	P	++	+	++	08OCT73	25OCT73
	GECS-DMV TOKYO-HONOLULU	+	++	P	++	+	++	31OCT73	29NOV73

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV	DEPTH	MAG	SUB	GRAY	BEGIN DATE	END DATE					
		D	1	D	3	P							
		P	1	2	1	.R			P				
		L	G	R	G	5			R				
		O	K	I	E	K	F	E	C	CS			
		T	T	H	T	C	T	H	L	CS			
	GECS-EMV HONOLULU-PAGO PAGO	+	++	P	++	+	++	0	0	0	0	04DEC73	29DEC73
	GECS-FMV PAGO PAGO-WELLINGTON	+	++	P	++	+	++	0	0	0	0	03JAN74	27JAN74
	GECS-GMV WELLINGTON-WELLINGTON (THERE IS NO LEG H)	+	++	P	++	+	++	0	0	0	0	05FEB74	04MAR74
	GECS-IMV WELLINGTON-PAPEETE,TAH.	+	++	P	++	+	++	0	0	0	0	13MAR74	07APR74
	GECS-JMV PAPEETE-PAPEETE,TAHITI	+	++	P	++	+	++	0	0	0	0	12APR74	09MAY74
	GECS-KMV PAPEETE,TAH.-SAN DIEGO	+	++	P	++	+	++	0	0	0	0	14MAY74	10JUN74
157	GOBS-E.B.SCRIPPS												
057	GORDA-HORIZON	+	0	P	0	+	-	0	0			8MAY65	23MAY65
173	GUAYMUS-T. WASHINGTON (S.I.)												
	GUAY01WT SAN DIEGO-GUAYMUS,MEX.	+	+	M	+	M	+	M	M	+	+	9FEB78	24FEB78
	GUAY02WT GUAYMUS-GUAYMUS,MEXICO	+	+	M	+	M	+	M	M	+	+	2MAR78	7MAR78
	GUAY03WT GUAYMUS-SAN DIEGO	+	+	M	+	M	+	M	M	+	+	8MAR78	17MAR78
058	HAWAII-BAIRD											11JUL59	24AUG59
088	HAYSTACK-BAIRD	+	0	P	0	0	-	0	0			24OCT64	3NOV64
162	HEAT FLOW-BAIRD	+	0	0	0	0	0	0	0			07MAR55	15MAR55
116	HERM-OCONO.												
	HERM-10T	+	++	P	++	+	++	0	0			15JAN69	19JAN69
005	HILO-SMITH												
	HILO01SM SAN DIEGO-LAHAINA,HAW.	+	++	P	++	+	0	0	0			16MAR62	31MAR62
	HILO02SM LAHAINA-HILO,HAWAII	+	++	P	0		0	0	0			03APR62	14APR62
	HILO03SM HILO-SAN DIEGO	+	++	P	++	+	++	0	0			16APR62	07MAY62
013	HILO-STRANGER												
	HILO01ST SAN DIEGO-KAHALUI,HAW	+	++	P	0		0	0	0			16MAR62	01APR62
	HILO02ST KAHALUI-HILO,HAWAII	+	++	P	0		0	0	0			03APR62	14APR62
	HILO03ST HILO-SAN DIEGO	+	++	P	/	*	+	++	0	0		16APR62	30APR62
103	HUDDELL	+	-	P	-	0	-	0	0			17SEP56	15OCT56
131	HYPUGENE-MELVILLE (S.I.)												
	HYPO-IMV SAN DIEGO-SAN DIEGO	+	++	M	++	+	++	M	M	+	++	11MAR72	21APR72
132	IGUANA- E.B.SCRIPPS (S.I.)												
	IGUA01EB SAN DIEGO-ACAPULCO,MEX	+	++	P	++	+	++	0	M	0	0	31MAR72	07APR72
	IGUA02EB ACAPUL-GUAYQUIL,ECUADOR	+	++	P	++	+	++	0	M	0	0	09APR72	17APR72
	IGUA03EB GUAY-PUNTA AREN,CSTRICA	+	++	P	++	+	++	0	M	0	0	21APR72	30APR72
	IGUA04EB PUNTA ARENA-ACAPULC,MEX	+	++	P	++	+	++	0	M	0	0	02MAY72	11MAY72
	IGUA05EB ACAPULCO,MEX-SAN DIEGO	+	++	P	++	+	++	0	M	0	0	15MAY72	22MAY72
169	INDOMED 77-MELVILLE (S.I.)												
	INMD01MV SAN DIEGO-BALBOA	+	+	0	0	+	+	+	0	0	0	24SEP77	31OCT77
	INMD02MV BALBOA-CADIZ, SPAIN	+	+	0	0	+	+	+	0	0	0	07NOV77	01DEC77
	INMD03MV CADIZ-ALEXANDRIA	+	+	0	0	+	+	+	0	0	0	4DEC77	12DEC77
	INMD04MV ALEXANDRIA-MAURITIUS	+	+	0	0	+	+	+	0	0	0	6DEC77	22JAN78
	INMD05MV MAURITIUS-FREEMANTLE	+	+	0	0	+	+	+	0	0	0	28JAN78	25FEB78
	INMD06MV FREEMANTLE-COLOMBO	+	+	0	0	+	+	+	0	0	0	06MAR78	31MAR78
	INMD07MV COLOMBO-MAURITIUS											04APR78	25APR78
	INMD08MV MAURITIUS-MAURITIUS											29APR78	28MAY78
	(CRUISE IN PROGRESS)												
	INMD09MV MAURITIUS-PORT SAID											01JUN78	04JUL78
	INMD10MV PORT SAID-ROTA											19JUL78	06AUG78
	INMD11MV ROTA-SAN JUAN											10AUG78	12SEP78

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG			SUB		GRAV		BEGIN DATE	END DATE
		D P L O T	I 2 G K I H T	D I I R G E I C T	3 P R O S O F H L	P R O C S				

	INMD12MV	SAN JUAN-MONTEVIDEO							17SEP78	18OCT78				
	INMD13MV	MONT.-CUM. RIVADAVIA							27OCT78	14NOV78				
	INMD14MV	RIVADAVIA-PT. ARENAS							17NOV78	24DEC78				
	INMD15MV	PUNTA ARENAS-PUNTA AREN.							29DEC78	3FEB79				
	INMD16MV	PUNTA ARENAS-MAZATLAN							9FEB79	3MAR79				
	INMD17MV	MAZATLAN-MAZATLAN							7MAR79	1APR79				
	INMD18MV	MAZATLAN-SAN DIEGO							5APR79	30APR79				
155	INDUPAC-T.	WASHINGTON (S.I.)												
	INDP01WT	SAN DIEGO-YOKOHAMA	+	+	P	+	+	+	M	O	+	0	23MAR76	30APR76
	INDP02WT	YOKOHAMA-AGANA, GUAM	+	+	P	+	+	+	+	O	+	0	5MAY76	19MAY76
	INDP03WT	AGANA, GUAM-AGANA	+	+	P	+	+	+	+	O	+	0	25MAY76	19JUN76
	INDP04WT	AGANA, GUAM-AGANA	+	+	P	+	+	+	+	M	+	+	22JUN76	5JUL76
	INDP05WT	AGANA-KEELUNG, TAIWAN	+	+	P	+	+	+	+	M	+	+	7JUL76	27JUL76
	INDP06WT	KEELUNG-SUBIC BAY	+	+	P	+	+	+	M	M	+	0	30JUL76	12AUG76
	INDP07WT	SUBIC BAY-DARWIN	+	+	P	+	+	+	M	M	+	+	14AUG76	29AUG76
	INDP08WT	DARWIN-AGANA, GUAM	+	+	P	+	+	+	+	M	+	+	31AUG76	30SEP76
	INDP09WT	AGANA-AGANA, GUAM	+	+	P	+	+	+	+	O	+	0	12JAN77	22JAN77
	INDP10WT	AGANA-SINGAPORE	+	+	P	+	+	+	M	M	+	+	25JAN77	21FEB77
	INDP11WT	SINGAPORE-PHUKET	+	+	O	O	+	+	M	M	+	0	01MAR77	21MAR77
	INDP12WT	PHUKET-PADANG, INDO	+	+	+	+	+	+	M	M	+	0	24MAR77	10APR77
	INDP13WT	PADANG-PADANG, INDO.	+	+	O	O	+	+	M	M	+	+	12APR77	23APR77
	INDP14WT	PADANG, INDO.-HONOLULU	+	+	P	+	+	+	M	M	+	+	27APR77	28MAY77
	INDP15WT	HONOLULU-HONOLULU	+	+	P	+	+	+	O	O	0	0	03JUN77	30JUN77
	INDP16WT	HONOLULU-SAN DIEGO	+	+	P	+	+	+	+	O	0	0	05JUL77	31JUL77
004	JAPANYON-SPENCER BAIRD													
	JPYN01BD	SAN DIEGO-HONOLULU	+	+	P	+	+	+	+	+	0	0	27MAY61	06JUN61
	JPYN02BD	HONOLULU-TOKYO	+	+	P	+	+	+	+	+	0	0	09JUN61	01JUL61
	JPYN03BD	TOKYO-TOKYO	0	0	0	0	0	0	0	0	0	0	07JUL61	27JUL61
	JPYN04BD	TOKYO-HONOLULU	+	+	P	+	+	+	+	+	0	0	01AUG61	18AUG61
	JPYN05BD	HONOLULU-SAN DIEGO	+	+	P	+	+	+	+	+	0	0	22AUG61	15SEP61
039	JASPER SEAMOUNT-HORIZON				E	-	+	0	0	0			19JUN51	28JUN51
059	KAYAK-OCONISTOTA				P	0	0	-	0	M			28AUG64	23SEP64
122	KNOCK KNOCK-ARGO		+	0	P	0			0	0			22JUL60	29JUL60
018	LEAPFROG-SMITH		+	/*	P	/*	0	-	0	0			24JUL61	12SEP61
060	LEAPFROG-STRANGER				P	0	0	-	0	0			31JUL61	15SEP61
014	LIMBO-HORIZON		+	/*	P	/*	0	-	0	0			16MAY60	01JUL60
012	LUSIAD-ARGO													
	LUSI01AR	SAN DIEGO-MANILA	+	+	P	+	+	+	+	0	0		15MAY62	11JUN62
	LUSI02AR	MANILA-SINGAPORE			P		+		0	0			16JUN62	24JUN62
	LUSI03AR	SINGAPORE-MOMBASA					0	0	0	0			28JUN62	24JUL62
	LUSI04AR	MOMBASA-COLOMBO					0	0	0	0			28JUL62	25AUG62
	LUSI05AR	COLOMBO-COCHIN					0	0	0	0			28AUG62	29SEP62
	LUSI06AR	COCHIN-AURITIUS	+	+	P	0	+	+	+	0	0		04OCT62	26OCT62
	LUSI06AR	AURITIUS-FREMANTLE	+	+	P	0	+	+	+	0	0		30OCT62	28NOV62
	LUSI06AR	FREMANTLE-DARWIN	+	+	P	0	+	+	+	0	0		02DEC62	23DEC62
	LUSI06AR	DARWIN-DJAKARTA	+	+	P	0	+	+	+	0	0		01JAN63	23JAN63
	LUSI06AR	DJAKARTA-COLOMBO	+	+	P	0	+	+	+	0	0		26JAN63	12FEB63
	LUSI07AR	COLOMBO-MOMBASA	+	+	P	0	+	+	+	0	0		16FEB63	17MAR63

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV		DEPTH	MAG	SUB	GRAV	BEGIN DATE	END DATE					
		D P L O T	1 I G K I H	D I G R G E I C	3 P R R R R R R	P R R R R R R								
							T			T	T	T	T	T
	LUSI7BAR MOMBASA-PENANG	+	+	P	0	+	++	0	0	21MAR63	12APR63			
	LUSI7CAR PENANG-MOMBASA	+	+	P	0	+	++	0	0	17APR63	15MAY63			
	LUSI7DAR MOMBASA-CAPETOWN	+	+	P	0	+	++	0	0	18MAY63	29MAY63			
	LUSI08AR CAPETOWN-FREETOWN	+		P	0	+		0	0	04JUN63	08JUL63			
	LUSI09AR FREETOWN-PANAMA	+	+	P		0	0	0	0	11JUL63	30JUL63			
	LUSI10AR PANAMA-SAN DIEGO	+	++	P	/	+	++	0	0	02AUG63	15AUG63			
001	LUSIAD-HORIZON													
	LUSI01HO CUCHIN-AURITIUS				0	0	0	0		04OCT62	26OCT62			
	LUSI02HO AURITIUS-FREMANTLE				0	0	0	0		30OCT62	28NOV62			
	LUSI03HO FREMANTLE-PORT DARWIN				0	0	0	0		02DEC62	23DEC62			
	LUSI04HO PORT DARWIN-PORT MURESB				0	0	0	0		28DEC62	02JAN63			
	LUSI05HO PORT MOKESBY-GUADALCANA				0	0	0	0		02JAN63	09JAN63			
	LUSI06HO GUADALCANAL-KWAJALEIN				0	0	0	0		10JAN63	17JAN63			
	LUSI07HO KWAJALEIN-HONOLULU	+	/	+	/	+	+	0	0	21JAN63	04FEB63			
	(DIGITAL DEPTH TAPE ID='LUSI-A')													
	LUSI08HO HONOLULU-SAN DIEGO	+	++	+	/	+	+	0	0	06FEB63	19FEB63			
	(DIGITAL DEPTH TAPE ID='LUSI-B')													
038	MENDOCINO-60-BAIRD			0	P	0	+	0	0	APR57	APR57			
061	MIDPAC-HORIZON	+	0	E	-	0	-	0	0	27JUL50	28OCT50			
062	MOHOLE PROJECT-BAIRD						0	-	0	0				
063	MOHOLE PROJECT-HORIZON						0	-	0	0				
064	MOHOLE PROJECT-ORCA						0	-	0	0				
006	MONSOON-ARGO													
	MONSO1AR SAN DIEGO-CAIRNS	+	++	P	++	+	++	0	0	26AUG60	06OCT60			
	MONSO2AR CAIRNS-DJAKARTA	+		P	0	+	++	0	0	17SEP60	14NOV60			
	MONSO3AR DJAKARTA-AURITIUS	+		P	++	+	++	0	0	18NOV60	07DEC60			
	MONSO4AR AURITIUS-FREMANTLE	+		P	++	+	++	0	0	10DEC60	02JAN61			
	MONSO4BAR FREMANTLE-HOBART	+				+	++	0	0	06JAN61	15JAN61			
	MONSO5AR HOBART-WELLINGTON	+	++	P	++	+	++	0	0	17JAN61	22JAN61			
	MONSO6AR WELLINGTON-WELLINGTON	+	++	P	++	+	++	0	0	28JAN61	22FEB61			
	MONSO7AR WELLINGTON-PAPEETE	+	++	P	++	+	++	0	0	24FEB61	15MAR61			
	MONSO8AR PAPEETE-SAN DIEGO	+	++	P	++	+	++	0	0	23MAR61	18APR61			
008	MUKLUK-SPENCER BAIRD													
	MKLK01BD SAN DIEGO-KODIAK, ALASKA	+	++	P	/	+	0	-	0	08JUL57	04AUG57			
	MKLK02BD KODIAK, ALAS.-SAN DIEGO	+	++	P	/	+	0	-	0	06AUG57	26AUG57			
065	MUKLUK-HORIZON	+	0	P	0	0	-	0	0	9JUL57	24AUG57			
165	MV70-03-MELVILLE	+	0	P	0	0	0	0	0	20MAR70	24MAR70			
003	NAGA-STRANGER													
	NAGA01ST SAN DIEGO-HONOLULU	+	+	P	/	+	0	0	0	17JUN59	28JUN59			
	NAGA02ST HONOLULU-GUAM	+	0	P	0	0	0	0	0	03JUL59	21JUL59			
	NAGA03ST GUAM-MANILA	+	0	P	0	0	0	0	0	24JUL59	8AUG59			
	NAGA04ST MANILA-NHATRANG, V.N.	+	0	E	0	0	0	0	0	13AUG59	17AUG59			
	NAGAS1ST BANGKOK-BANGKOK	+	0	E	0	0	0	0	0	19OCT59	31OCT59			
	NAGAS2ST BANGKOK-BANGKOK	+	0	E	0	0	0	0	0	16NOV59	16DEC59			
	NAGAS3ST BANGKOK-BANGKOK	+	0	E	0	0	0	0	0	19JAN60	31JAN60			
	NAGAS4ST BANGKOK-BANGKOK	+	0	E	0	0	0	0	0	15FEB60	21MAR60			
	NAGAS5ST BANGKOK-BANGKOK	+	0	E	0	0	0	0	0	21APR60	3MAY60			
	NAGAS6ST BANGKOK-BANGKOK	+	0	E	0	0	0	0	0	23MAY60	28JUN60			

		NAV	DEPTH	MAG	SUB	GRAV		
		O	I	D	O	3	P	P
		P	I	2	I	.	R	R
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
ID.	CRUISE NAME - SHIP	T	T	H	T	C	T	H
NUM	LEG - PORTS	T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		O	I	K	I	E	I	K
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		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
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		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
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		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
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		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		O	I	K	I	E	I	K
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
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		L	G	G	R	G	5	O
		O	I	K	I	E	I	K
		T	T	H	T	C	T	H
		L	G	G	R	G	5	O
		O	I	K	I	E	I	

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG SUB GRAV						BEGIN DATE	END DATE				
		D 1 D D 3 P P											
		P 1 2 1 I . R R											
		L G G R G 5 0 R 0											
		O I K I E I K F E C											
		T T H T C T H L C S											
	PIQR06WT CALLAO-CALLAO, PERU	+	++	P	++	+	++	/	+	23APR69	20MAY69		
	PIQR07WT CALLAO-CALLAO, PERU	0	0	0	0	+	0	0	+	27MAY69	22JUN69		
	PIQR08WT CALLAO-BALBOA, C.Z.	+	++		0	+	++	0	+	25JUN69	05JUL69		
	PIQR09WT BALBOA-SAN DIEGO	+	0	P	0	0	0	0	+	09JUL69	11AUG69		
156	PLEIADES-MELVILLE (S.I.)												
	PLDS-TMV SAN DIEGO-SAN DIEGO	0	+	M	0	M	0	M	M	0	0	02APR76	05APR76
	PLDS01MV SAN DIEGO-BALBOA, C.Z.	+	+	0	+	+	+	+	0	0	0	27APR76	5JUN76
	PLDS02MV BALBOA, C.Z.-BALBOA	+	+	0	+	+	+	+	0	0	0	11JUN76	9JUL76
	PLDS03MV BALBOA, C.Z.-HONOLULU	+	+	0	+	M	+	M	M	0	0	13JUL76	12AUG76
	PLDS04MV HONOLULU-SAN DIEGO	+	0	+	+	+	0	+	0	0	0	17AUG76	23SEP76
016	PROA-SPENCER BAIRD												
	PROA01BD SAN DIEGO-GUAM		++			0		0	0			15MAR62	04APR62
	PROA02BD GUAM-SUVA, FIJI	0	0	0	0	0	0	0	0			10APR62	10JUN62
	PROA3ABD SUVA-APIA, SAMOA		++	P	++	0	0	0	0			13JUN62	01AUG62
	PROA3BBD APIA-HONOLULU		++	P	++	0	0	0	0			06AUG62	31AUG62
	PROA04BD HONOLULU-SAN DIEGO		++	P	/	+	++	0	0			04SEP62	03OCT62
090	QUARTET-HORIZON	+	0	P	0	0	-	0	+			25JAN65	3FEB65
120	QUEBRADA-T. WASH.	0		0		0						06NOV69	21DEC69
017	RISEPAC-SPENCER BAIRD												
	RISPO1BD SAN DIEGO-CALLAO, PERU	+	++	M	++	+	++	0	+			27OCT61	27NOV61
	RISPO2BD CALLAO-PAPEETE, TAHITI	+	++	M	++	+	++	0	+			30NOV61	31DEC61
	RISPO3BD PAPEETE-SAN DIEGO	+	++	M	++	+	++	0	+			03JAN62	05FEB62
161	SAHUL SHELF - STRANGER (PART OF NAGA EXPEDITION LEG SIIA)												
113	SATPAC-DAVIS												
	SATP-1DV SEATTLE-SEATTLE, WASH.	+	++	P	++	+	++	0	0			07SEP68	13SEP68
117	SCAN-ARGO												
	SCAN01AR SAN DIEGO-SAN DIEGO	+	++	P	++	+	++	+	M			04MAR69	30MAR69
	SCAN02AR SAN DIEGO-HONOLULU	+	++	P	++	+	++	+	M			08APR69	04MAY69
	SCAN03AR HONOLULU-YOKOHAMA, JAPAN	+	++	P	++	+	++	+	M			10MAY69	09JUN69
	SCAN04AR YOKOHAMA-APRA, GUAM	+	++	P	++	+	++	+	M			15JUN69	30JUN69
	SCAN05AR APRA, GUAM-SAN DIEGO	+	++	P	++	+	++	+	M			04JUL69	04AUG69
	SCAN06AR SAN DIEGO-HONOLULU	0	0	P	0	0	0	+	0			12AUG69	12SEP69
	SCAN07AR HONOLULU-PAPEETE, TAHITI	0	0	P	0	0	0	0	0			19SEP69	14OCT69
	SCAN08AR PAPEETE-PAPEETE, TAHITI	+	++	P	++	+	++	+	M			18OCT69	13NOV69
	SCAN09AR PAPEETE-BALBOA, C.Z.	+	++	P	++	+	++	+	M			18NOV69	20DEC69
	SCAN10AR BALBOA-ACAPULCO, MEX.	+	++	P	++	+	++	+	M			30DEC69	28JAN70
	SCAN11AR ACAPULCO, MEX.-SAN DIEGO	+	++	P	++	+	++	+	M			01FEB70	19FEB70
070	SCOT-BAIRD	+	0	P	-	0	-	0	0			28APR58	07JUL58
123	SEVEN TOW-T. WASHINGTON												
	7TOW01WT SAN DIEGO-HONOLULU	+	0	P	0	+	0	+	+			22JAN70	24FEB70
	7TOW02WT HONOLULU-HONOLULU	0	0		0	0	0		0			28FEB70	20MAR70
	7TOW3AWT HONOLULU-HONOLULU	+	0	P	0	+	0	+	+			23MAR70	03APR70
	7TOW3BWT HONOLULU-PAGO PAGO, SAMOA	+	++	P	++	+	++	+	+			06APR70	22APR70
	7TOW04WT PAGO PAGO-TONGA, TAPU IS.	+	0	P	0	+	0	0	+			25APR70	13MAY70
	7TOW05WT TONGA-APIA, SAMOA	+	++	P	++	+	++	+	+			16MAY70	30MAY70
	7TOW06WT APIA, SAMOA-HONOLULU	+	++	P	++	+	++	+	M			03JUN70	29JUN70
	7TOW07WT HONOLULU-ADAK, ALASKA	+	0	P	0	0	0		0			02JUL70	23JUL70
	7TOW08WT ADAK-ASTORIA, OREGON	+	++	P	0	+	++	+	M			26JUL70	17AUG70

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG SUB GRAV						BEGIN DATE	END DATE
		D	1 D	D	3 P	P			
		P	2 I	I	. R	R			
		L G	G	R G	5 O	R O			
		O	I	E	I	K	F	E	C
		T	T	H	T	C	T	H	L
	7TOW9AWT ASTORIA,ORE-EUREKA,CAL.	0	P	0	+	0		21AUG70	03SEP70
	7TOW9BWT EUREKA-EUREKA,CAL.	+	0	P	0	+	0	M	04SEP70 14SEP70
	7TOW10WT EUREKA-SAN DIEGO,CAL.	+	+	P	0	+	+	M	15SEP70 25SEP70
071	SHELLBACK-HORIZON		E	-	0	-	0	0	17MAY52 27AUG52
072	SHOW-ARGO (SAME AS ZETES LEG 6)								
073	SHOW-HORIZON	+	0	P	0	0	-	0	11MAY56 12JUL56
105	SHUTTLE		E	-	0	-	0	0	2MAY52 21JUN52
140	SIQUEIROS-THOMAS WASHINGTON (S.I.)								
	SIQR-1WT SAN DIEGO-SAN DIEGO	+	+	M	+	+	+	M	M
031	SIXPAC-HORIZON								
	SIXP-1HO HONOLULU-HONOLULU	+	+	P	+	+	+	0	+
095	SOUTHERN BORDERLAND II-HORIZON	+	0	P	0	0	-	0	0
042	SOUTHERN BORDERLAND III-BAIRD	+	0	P	0	+	0	0	0
096	SOUTHERN BORDERLAND IV-BAIRD	+	0	P	0	0	-	0	0
097	SOUTHERN BORDERLAND V-ORCA	+	0	P	0	0	-	0	0
098	SOUTHERN BORDERLAND VI-ORCA	+	0	P	0	0	-	0	0
167	SOUTHERN BORDERLANDS-DAVIS								
	S0B001DV SAN DIEGO-SAN DIEGO	+	0	P	0	0	0	0	0
	S0B002DV SAN DIEGO-SAN DIEGO	+	0	0	0	0	0	0	+
	S0B003DV SAN DIEGO-SAN DIEGO	+	0	0	0	0	0	0	+
	S0B004DV SAN DIEGO-SAN DIEGO	+	0	P	0	0	0	0	+
	S0B005DV SAN DIEGO-SAN DIEGO	+	0	0	0	0	0	0	+
	S0B006DV SAN DIEGO-SAN DIEGO	+	0	0	0	0	0	0	+
130	SOUTHTOW-T.WASHINGTON (S.I.)								
	S0TW00WT SAN DIEGO-SAN DIEGO	+	0	P	0	+	0	0	+
	S0TW01WT SAN DIEGO-TAHITI	+	+	P	+	+	+	M	M
	S0TW02WT TAHITI-VALPARAISO,CHILE	+	+	M	+	+	+	M	M
	S0TW03WT VALPO-ANTOFAGASTA,CHILE	+	+	P	+	+	+	M	M
	S0TW04WT ANTIFA,CHIL-CALLAO,PERU	+	+	M	+	+	+	0	M
	S0TW05WT CALLAO-QUAYAQUIL,EQUADR	+	+	P	+	+	+	+	M
	S0TW06WT GUAYAQUIL-BALBOA,C.Z.	+	+	P	+	+	+	+	M
	S0TW07WT BALBOA,C.Z.-CALLAO,PERU	+	+	P	+	+	+	+	M
	S0TW08WT CALLAO-PAPEETE,TAHITI	+	+	P	+	+	+	+	M
	S0TW09WT PAPEETE-PAGO PAGO,SAMOA	+	+	P	+	+	+	+	0
	S0TW10WT PAGO PAGO-PAGO PAGO,SAM	+	+	P	+	+	+	+	M
	S0TW11WT PAGO PAGO-APIA,W.SAMOA	+	+	P	+	+	+	+	M
	S0TW12WT PAGO PAGO,SAMOA-HONO,HA	+	+	P	+	+	+	+	M
	S0TW13WT HONO,HAWAII-SAN DIEGO	+	+	P	+	+	+	+	0
091	SPECTACLE HILLS-HORIZON	+	0	E	-	0	-	0	0
084	SPHERES-HORIZON	0	0	P	0	0	-	0	0
127	SPLIT 1-E.B.SCRIPPS								
	SPL1-1EB	0	+	P	0	+	+	0	0
128	SPLIT 2-E.B.SCRIPPS								
	SPL2-1EB	0	+	P	0	+	+	0	0
026	STEP 1-HORIZON								
	STEP01HO SAN DIEGO-CALLAO,PERU	/	/	+	P	/	+	0	-
	(DIGITAL DEPTH TAPE ID='STEP-A')								
	STEP02HO CALLAO-ANTOFAGASTA,CHILI								

		NAV DEPTH MAG			SUB	GRAV		
ID. NUM	CRUISE NAME - SHIP LEG - PORTS	D	1 D	D	3 P	P	BEGIN DATE	END DATE
		P I	2 I	I	. R	R		
		L G	G	R G	5 O	R O		
		O I	K I	E I	K F	E C		
		T T	H T	C T	H L	C S		
STEP03HO ANTOFAGASTA-SAN DIEGO / /* P /* 0 - 0 0							17NOV60	14DEC60
(DIGITAL DEPTH TAPE ID='STEP-B')								
111	STYX-ALEXANDER AGASSIZ							
	STYX01AZ SAN DIEGO-HONOLULU, HAW.	+	++	P	++	+	++	0 0
	STYX02AZ HONOLULU-PAGO PAGO, SAM.	+	++	P	++	+	++	0 M
	STYX03AZ PAGO PAGO-APIA, SAMOA	+	++	P	++	+	++	0
	STYX04AZ APIA-APIA, SAMOA	+	++	P	++	+	++	0
	STYX05AZ APIA-PAGO PAGO, SAMOA	+	++	P	++	+	++	0
	STYX06AZ PAGO PAGO-HONOLULU	+	++	P	++	+	++	0
	STYX07AZ HONOLULU-MIDWAY ISLAND	+	++	P	++	+	0	0
	STYX08AZ MIDWAY-HONOLULU	+	++	P	++	+	++	0
	STYX09AZ HONOLULU-PAGO PAGO, SAM.	+	++	P	++	+	++	0
	STYX10AZ PAGO PAGO-SAN DIEGO	+	++	P	++	+	++	0
022	SWANSON-ARGO							
	SWAN-1AR	+	++	P	/*	+	++	0 0
138	TASADAY-THOMAS WASHINGTON (S.I.)						05SEP61	1DEC61
	TSDY01WT SAN DIEGO-HONOLULU	0	0	0	0	0	0	0
	TSDY02WT HONOLULU-HONOLULU	0	++	0	0	0	0	0
	TSDY03WT HONOLULU-YOKOHAMA, JAPAN	+	++	P	++	+	++	+
	TSDY04WT YOKOHAMA-YOKOHAMA	+	++	M	++	0	0	0
	TSDY05WT YOKOHAMA-SINGAPORE	+	++	P	++	+	++	M
	TSDY06WT SINGAPORE-SINGAPORE	+	+	0	+	+	M	M
	TSDY07WT SINGAPORE-APRA, GUAM	+	++	P	++	+	++	+
	TSDY08WT APRA, GUAM-HONOLULU	+	++	P	++	+	++	M
	TSDY09WT HONOLULU-HONOLULU	+	++	P	++	+	++	0
	(THERE IS NO LEG 10)							
	TSDY11WT HONOLULU-SAN DIEGO	+	++	0	0	0	0	0
159	T.B. DAVIE							
	TBD 01TD	+	+	0	0	0	++	0 0
	TBD 02TD	+	+	0	0	0	++	0 0
007	TETHYS-SPENCER BAIRD							
	TETH01BD SAN DIEGO-HONOLULU, HA.	+	+	P	0	0	0	0
	TETH02BD HONOLULU-HONOLULU	+	++	P	/*	0	0	0
	TETH03BD HONOLULU-SAN DIEGO	+	++	P	/*	0	0	0
134	TIPTOW-T. WASHINGTON							
	TPTW-1WT	0	+			++	0	M
110	TODOS SANTOS-SMITH			P	0	+	0	0
109	TORO-BAIRD			E	-	0	-	0
114	TOW I-.WASH	+	0	P	-	+	0	+
164	TOW JUAN-WASHINGTON	+	0	P	0	0	0	0
135	TOWMAS-T. WASHINGTON							
	TOWM-1WT	0	+			++	0	M
074	TRANSPAC-BAIRD	+	0	E	-	0	-	0
028	TRIPOD-ARGO							
	TRIP01AR SAN DIEGO-PUNTARENAS	+	++	M	++	+	++	0
	TRIP02AR PUNTARENAS-ACAPULCO	+	++	M	++	+	++	0
	TRIP03AR ACAPULCO-SAN DIEGO	+	++	M	++	+	++	0
036	T. WASHINGTON-65-1							

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV	DEPTH	MAG	SUB	GRAV	BEGIN DATE	END DATE
		D	1 D	D	3 P	P		
		P I	2 I	I	. R	R		
		L G	G	R G	5 0	R 0		
		0 I	K I	E I	K F	E C		
		T T	H T	C T	H L	C S		
	W651-1WT	+	++	P 0	+	++	0 M	07FEB66 01MAR66
108	VACQUIER MAG-S.BAIRD	0	P 0	+	0	0 0	30 JUL59	28AUG59
075	VERMILION SEA-BAIRD	0	P 0	0	-	0 0	FEB59	JUN59
076	VERMILION SEA-HORIZON	0	P 0	0	-	0 0	FEB59	JUN59
107	VIZCAINO BAY-HORIZON	0	E -	0	-	0 0	31JAN56	7FEB56
024	WAHINE-BAIRD							
	WAHI01BD SAN DIEGO-HONOLULU	+	0	M 0	0	-	0 0	16FEB65 19MAR65
	WAHI02BD HONOLULU-SAN DIEGO			M 0	0	-	0 M	22MAR65 10APR65
077	WIGWAM-BAIRD	0	E -	0	-	0 0		
078	WIGWAM-HORIZON	0	E -	0	-	0 0		
079	WIGWAM-PAOLINA-T	0	E -	0	-	0 0		
080	WIGWAM-T-441	0	E -	0	-	0 0		
147	WILDCAT-OT			P 0		M	20AUG67	25SEP67
106	YOYO-BAIRD			E -	0	-	0 0	20FEB54 3MAR54
027	ZAPOTEC-BAIRD	+	/*	P /*	0	-	0 0	24OCT60 6NOV60
081	ZEPHYRUS-HORIZON	+	0	P 0	0	-	0 +	17JUN62 16SEP62
034	ZETES - ARGO							
	ZTES01AR SAN DIEGO-KODIAK, ALASKA	+	+	P 0	0	0	0 0	04JAN66 24JAN66
	ZTES2AAR KODIAK-ADAK, ALASKA	+	++	P ++	0	0	0 0	27JAN66 20FEB66
	ZTES2BAR ADAK-HAKODATE, JAPAN	+	++	P ++	+	++	0 0	23FEB66 01APR66
	ZTES03AR HAKODATE-HAKODATE, JAPAN	+	++	P ++	+	++	0 +	05APR66 02MAY66
	ZTES04AR HAKODATE-TOKYO, JAPAN	+	++	P ++	+	++	0 +	06MAY66 26MAY66
	ZTES4BAR TOKYO-TOKYO, JAPAN	+	++	P ++	+	-	0 0	30MAY66 05JUN66
	ZTES05AR TOKYO-HONOLULU, HAWAII	+	++	P ++	+	++	0 0	10JUN66 21JUN66
	ZTES06AR HONOLULU-HILO, HAWAII	+	++	P ++	+	++	0 0	23JUN66 12JUL66
	ZTES6BAR HILO-HONOLULU, HAWAII	+	++	P ++	+	++	0 0	13JUL66 18JUL66
	ZTES07AR HONOLULU-SAN DIEGO	+	++	P ++	+	++	0 0	23JUL66 08AUG66

ID. NUM	CRUISE NAME - SHIP LEG - PORTS	NAV DEPTH MAG SUB GRAV						BEGIN DATE	END DATE
		D P L O T	1 I G K H	D 2 G I E T	D I R G E C T	3 P 5 D K F H	P R O E C S		

*** NON-SIO CRUISES PROCESSED BY U/W DATA PROCESSING GROUP ***

901	EXPLORER 60								
	XP6001EX		+	+	0	-	+	+	0 0
								17FEB60	
150	GALLIENI								
	GAL14AGA REUNION-MAURITIUS(PART)	0	/	0	/	0 0	0 0	16FEB71	19FEB71
	GAL14BGA MADAGAS.-C.RECIFE(PART)	0	/	0	/	0 0	0 0	17MAR71	24APR71
	GAL15AGA REUNION-KERGUELEN(PART)	0	/	0	/	0 0	0 0	10FEB72	17FEB72
	GAL15BGA KERGUELEN-MAURIT.(PART)	1	/	0	/	0 0	0 0	14MAR72	19MAR72
544	HUNT								
	HUNT01HT		+	+	+	+	+	06OCT69	26OCT69
	HUNT02HT		+	+	+	+	+	02NOV69	23NOV69
	HUNT03HT		+	+	+	+	+	29NOV69	17DEC69
151	MARION DUFRESNE								
	MDUFOAMD REUNION-REUNION(PART)	0	/	0	/	0 0	0 0	28APR73	11MAY73
	MDUFOBMD REUNION-MAURITIUS(PART)	0	/	0	/	0 0	0 0	29MAY73	6JUN73
	MDUF1AMD MAURITIUS-REUNION(PART)	0	/	0	/	0 0	0 0	11JUN73	16JUN73
	MDUF1BMD REUNION-MAURITIUS(PART)	0	/	0	/	0 0	0 0	8JUL73	11JUL73
	MDUF03MD REUNION-KERGUELEN(PART)	0	/	0	/	0 0	0 0	27MAR74	29MAR74
154	MEL1-1-MELVILLE								
	MEL1-1MV SAN DIEGO-SAN DIEGO		+	+	0 0	+	0	10APR76	16APR76
888	SEIFUMARU-70								
	SF70-1SF		0	+	0	+	0 0	20MAY70	
543	SILASBENT-BENT								
	SILS01BT		+	+	+	+	+	05OCT69	23OCT69
	SILS02BT		+	+	+	+	+	29OCT69	23NOV69
	SILS03BT		+	+	+	+	+	29NOV69	21DEC69
809	VALERO-70								
	VL70-1VR		0	+	0 0	0	+	18NOV70	01DEC70

SIO2 NAVIGATION FORMAT

 NAVIGATION TIME SERIES - GENERAL INFORMATION

1. FORMAT = SIO2(SCRIPPS DESIGNATION)
2. TIME BASE = HOUR, MINUTE, MONTH, DAY, YEAR (GMT)
3. SIGN CONVENTION = (SEE FORMAT)
4. POSITION CONTROL = SATELLITE NAVIGATION
5. CRITERIA FOR TURNING POINT SELECTION = GYRO AND E-M LOG SAMPLED AT 2 SEC. INTERVALS, AVERAGED FOR 2 MIN. INTERVALS AND THIS VALUE STORED. A COURSE OR SPEED CHANGE IS DEFINED AS OCCURRING WHENEVER THE DR POSITION FROM A GIVEN 2 MIN. VALUE DIFFERS FROM THE POSITION DETERMINED FROM EXTENDING THE PREVIOUS 2 MIN. VALUE BY MORE THAN 0.01 MILE.
6. CURRENT VELOCITY DETERMINATION = (NOT SUPPLIED IN SIO2 FORMAT)
7. TRACK CORRECTION METHOD = STANDARD METHOD FOR TRACK BETWEEN PAIRS OF FIXES. DRIFT(CURRENT) VECTOR CALCULATED BY DIFFERENCE IN POSITION OF DR TRACK AND SECOND FIX. THIS VECTOR THEN ADDED PROPORTIONALLY TO ALL COURSE AND SPEED POINTS BETWEEN THE TWO FIXES.

* NAVIGATION FORMAT(SIO2) *

FORMAT(1X,2I2,1X,3I2,14,2X,I2,1X,F4.1,A1,1X,I3,1X,F4.1,A1,2X,2A8,10X,2A8)

COLS.	FORMAT	VARIABLE
2- 3	I2	HOURS, TIME OF NAV. POINT
4- 5	I2	MINUTES
7- 8	I2	MONTH
9-10	I2	DAY
11-12	I2	YEAR
13-16	I4	TIME ZONE (INTEGER ONLY - BLANK, 0, OR -0 IF GMT)
19-20	I2	LATITUDE, DEGREES
22-25	F4.1	LATITUDE, MINUTES AND TENTHS
26	A1	LATITUDE, HEMISPHERE, N=NORTH, S=SOUTH
28-30	I3	LONGITUDE, DEGREES
32-35	F4.1	LONGITUDE, MINUTES AND TENTHS
36	A1	LONGITUDE, HEMISPHERE, E=EAST, W=WEST
39-54	2A8	COMMENTS ABOUT POINT(SAT=SATELLITE FIX, *=STAR FIX, LOR=LORAN, RAD=RADAR, LAN=LOCAL APPARENT NOON, C/C=COURSE CHANGE, C/S=SPEED CHANGE, C/CS=BOTH CSE AND SPEED CHANGE (THIS COMMENT FIELD WILL BE BLANK IF GENERATED ON IBM 1800 COMPUTER)
65-80	2A8	CRUISE, SHIP, LEG IDENTIFICATION (CRUISE AND LEG IN COLS. 65-69 IF GENERATED ON IBM 1800 COMPUTER, AND REMAINDER OF FIELD IS BLANK)

\$\$\$ END DOCUMENTATION - SIO2 NAVIGATION FORMAT \$\$\$

SIO Reference Report 78-15: Appendix II

SIO2 DEPTH/MAGNETICS FORMAT

***** DEPTH TIME SERIES - GENERAL INFORMATION

1. FORMAT = SIO2(SCRIPPS DESIGNATION)
2. TIME BASE = HOUR, MINUTE, DAY, MONTH, YEAR (GMT)
3. FATHOMETER = GIFFT DEPTH RECORDER
4. TRANSDUCER DEPTH (K/V MELVILLE) = APPROX. 15 FEET (NO CORRECTION APPLIED)
5. DEPTHS IN FATHOMS (800FM/SEC. ASSUMED SOUND VELOCITY)
6. NO SOUND VELOCITY CORRECTIONS APPLIED.
7. DIGITIZED FROM VALUES LOGGED MANUALLY FROM ANALOGUE RECORD AT 5 MINUTE INT.
8. ESTIMATED ACCURACY FROM TRACK CROSSINGS = 0.2 TO 2 MILE

***** MAGNETIC TIME SERIES - GENERAL INFORMATION

1. FORMAT = SIO2(SCRIPPS DESIGNATION)
2. TIME BASE = HOUR, MINUTE, DAY, MONTH, YEAR (GMT)
3. INSTRUMENT USED = VARIAN MAGNETOMETER
4. READINGS IN GAMMA, TOTAL FIELD, NO REGIONAL FIELD OR DIURNAL VARIATION REMOVED
5. DIGITIZING INTERVAL = 5 MINUTES FROM DATA AUTO LOGGED AT 1 MINUTE INTERVAL
6. AVERAGE DISTANCE SENSOR TOWED BEHIND SHIP = 500 FEET
7. ESTIMATED ACCURACY FROM TRACK CROSSINGS = 0.2 TO 2 MILE

* DEPTH OR MAGNETIC TIME SERIES FORMAT(SIO2) *

TIME SERIES DECKS CONTAIN 2 FORMATS. ONE DAY-HEADER CARD PRECEEDS THE DATA CARDS FOR EACH DAY. THE LAST CARD CONTAINING DATA (WHICH MAY BE PARTIALLY BLANK) FOR EACH DAY IS FOLLOWED BY A BLANK CARD. MORE THAN ONE DAY-HEADER CARD MAY BE REQUIRED PER DAY IF THE TIME ZONE CHANGES.

- DAY-HEADER CARD FORMAT -
FORMAT(I2,1X,I2,1X,I4,3X,F5.1)

COLS.	FORMAT	VARIABLE
1- 2	I2	DAY
4- 5	I2	MONTH
7-10	I4	YEAR
14-18	F5.1	TIME ZONE

- DATA CARD FORMAT -
FORMAT(8(1X,I2,I2,I5))

COLS.	FORMAT	VARIABLE
2- 3	I2	HOUR
4- 5	I2	MINUTE
6-10	I5	DEPTH (IN UNCORRECTED FATHOMS) OR MAGNETICS (TOTAL FIELD IN GAMMA)
11-20 TO 71-80		ABOVE SEQUENCE REPEATS

\$\$\$ END DOCUMENTATION - SIO2 DEPTH/MAGNETICS FORMAT \$\$\$

SIO Reference Report 78-15: Appendix III

TIME IN ACCUM. MINUTES-VS-NAVIGATION FORMAT

S M SMITH (S.I.O.) NOV. 7, 1969 (REV. JUNE 1972)

HEADER CARD

CARD FORMAT(I4,1X,A8,1X,2A8,14,1X,I4,1X,I6,I4,1X,A8,A4)

COL.	FORMAT	EXPLANATION
1- 4	I4	FILE NUMBER OF SOURCE TAPE
6-13	A8	ALPHANERIC IDENTIFIER OF SOURCE TAPE
15-30	2A8	ALPHANERIC CRUISE, SHIP, LEG IDENTIFIER
31-34	I4	CRUISE ID. NUMBER
36-39	I4	START TIME OF DATA IN HOURS AND MINUTES
41-46	I6	START DATE OF DATA (MONTH, DAY, YEAR)
47-50	I4	START TIME ZONE OF DATA (NEGATIVE EAST OF GREENWICH, POSITIVE TO WEST)
52-63	A8, A4	DATE DATA WAS ADDED TO SOURCE TAPE

DATA CARDS

CARD FORMAT(I7,2F10.3,F10.2,I5)

COL.	FORMAT	EXPLANATION
1- 7	I7	TIME IN ACCUMULATED MINUTES FROM START OF DATA FILE
8-17	F10.3	LATITUDE (DECIMAL DEGREES FROM EQUATOR, POSITIVE TO NORTH, NEGATIVE TO SOUTH)
18-27	F10.3	LONGITUDE (DECIMAL DEGREES, ORIGIN AT GREENWICH MERIDIAN INCREASING POSITIVELY TO WEST 0 TO 359.9999...
28-37	F10.2	DISTANCE IN NAUTICAL MILES FROM START OF DATA FILE
38-42	I5	POINT IDENTIFIER = 1 FIRST POINT OF FILE = 2 CALCULATED POINT OR FIX = 3 (DEPTH OR MAGNETIC DATA FLAG) = 4 FIVE DEGREE CROSSING - SOUTH TO NORTH = 5 FIVE DEGREE CROSSING - NORTH TO SOUTH = 6 FIVE DEGREE CROSSING - WEST TO EAST = 7 FIVE DEGREE CROSSING - EAST TO WEST

TAPE FORMAT (AS WRITTEN ON CDC 3600 AT UCSD COMPUTER CENTER)

TAPE IS 7 TRACK, EVEN (BCD) PARITY, NRZ MODE. DENSITY WILL BE 200, 556, OR 800 BPI AS REQUESTED. EACH CRUISE LEG FORMS A FILE TERMINATED BY AN EOF MARK. THE 80 CHARACTER CARD IMAGES ARE BLOCKED INTO RECORDS OF 8000 CHARACTERS (100 CARDS). THE LAST RECORD OF EACH FILE WILL BE FILLED OUT WITH BLANKS (OR OTHER CHARACTER AS REQUESTED). THE HEADER CARD IMAGE IS IN THE FIRST 80 CHARACTERS OF THE FIRST RECORD OF EACH FILE. THE EOF MARK OF THE LAST FILE IS FOLLOWED BY A TERMINATION LABEL CONSISTING OF AN EOF MARK AND A 16 CHARACTER BCD RECORD 'RENDREEL FINAL' (WHERE # IS EQUIVALENT TO 36 OCTAL EXTERNAL BCD CODE)

\$\$\$ END DOCUMENTATION - TIME IN ACCUM. MINUTES-VS-NAVIGATION \$\$\$

SIO Reference Report 78-15: Appendix IV

TIME IN ACCUM. MINUTES-VS-DEPTH OR MAGNETICS FORMAT

S M SMITH (S.I.O.) NOV. 7, 1969

HEADER CARD

CARD FORMAT(I4,1X,A8,1X,2A8,14,1X,14,1X,16,14,1X,A8,A4)

COL.	FORMAT	EXPLANATION
1- 4	I4	FILE NUMBER OF SOURCE TAPE
6-13	A8	ALPHAMERIC IDENTIFIER OF SOURCE TAPE
15-30	2A8	ALPHAMERIC CRUISE, SHIP, LEG IDENTIFIER
31-34	I4	CRUISE ID. NUMBER
36-39	I4	START TIME OF DATA IN HOURS AND MINUTES
41-46	I6	START DATE OF DATA (MONTH, DAY, YEAR)
47-50	I4	START TIME ZONE OF DATA (NEGATIVE EAST OF GREENWICH, POSITIVE TO WEST)
52-63	A8, A4	DATE DATA WAS ADDED TO SOURCE TAPE

DATA CARDS (PRINTED LIST HAS SPACES ADDED FOR LEGIBILITY)

CARD FORMAT(16I5)

COL.	FORMAT	EXPLANATION
1- 5	I5	TIME OF DEPTH OR MAGNETIC VALUE(I) IN ACCUMULATED MINUTES FROM START OF DATA FILE
6-10	I5	VALUE(I) DEPTH IN UNCORRECTED FATHOMS MAGNETICS, TOTAL FIELD IN GAMMA, RECORDED VALUE ROUNDED DOWN TO NEXT LOWER INTEGER MULTIPLE OF 5 GAMMA
11-15	I5	TIME OF VALUE(I+1)
16-20	I5	VALUE(I+1)
.		
71-75	I5	TIME OF VALUE(I+7)
76-80	I5	VALUE(I+7)

TAPE FORMAT (AS WRITTEN ON CDC 3600 AT UCSD COMPUTER CENTER)

TAPE IS 7 TRACK, EVEN (BCD) PARITY, NRZ MODE. DENSITY WILL BE 200, 556, OR 800 BPI AS REQUESTED. EACH CRUISE LEG FORMS A FILE TERMINATED BY AN EOF MARK. THE 80 CHARACTER CARD IMAGES ARE BLOCKED INTO RECORDS OF 8000 CHARACTERS (100 CARDS). THE LAST RECORD OF EACH FILE WILL BE FILLED OUT WITH BLANKS (OR OTHER CHARACTER AS REQUESTED). THE HEADER CARD IMAGE IS IN THE FIRST 80 CHARACTERS OF THE FIRST RECORD OF EACH FILE. THE EOF MARK OF THE LAST FILE IS FOLLOWED BY A TERMINATION LABEL CONSISTING OF AN EOF MARK AND A 16 CHARACTER BCD RECORD "END REEL FINAL" (WHERE # IS EQUIVALENT TO 36 OCTAL EXTERNAL BCD CODE)

\$\$\$ END DOCUMENTATION - TIME IN ACCUM. MINUTES-VS-DEPTH/MAGNETICS \$\$\$

Ship and Cruise Id.	Time Zone	Year	Month	Day	Hour	Minute	Latitude	Longitude	Navigation Point Id.	Fix Description*	Azimuth of Current	Velocity of Current
92108-055	591023	1957	05	1234	170	1234	11320	0.7				

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NAS NAVIGATION FORMAT (continued)

Each point in the navigation time series should be represented by one record containing the following parameters:

Ship and cruise identification	xxxxxxxx	V2108	
Time zone	±xx _A xx	-05.5	
Year	xx	69	
Month	xx	10	
Day	xx	23	
Hour	xx	12	
Minute	xx _A x	15.7	
Latitude	±xx.xxxx	-35.1234] + for north - for south
Longitude	±xxx.xxxx	-178.1234	
] + for east - for west
Navigation point identification	x	1 (1 for fix, 2 for change of course and/or speed)	
Fix description *	x	1	
Azimuth of current	xxx	320 degrees] following the navigation point
Velocity of current	xx.x	2.7 knots	

* Code for fix description

0	Unspecified	6	Loran A
1	Decca	7	Loran C
2	Visual	8	Omega or VLF
3	Radar	9	Satellite
4	Celestial - Star fix		
5	Celestial - Advanced sun line		

\$\$\$ END DOCUMENTATION - NAS NAVIGATION FORMAT \$\$\$

SIO Reference Report 78-15: Appendix VI

NGDC MERGE-MERGE FORMAT

*** TAPE CHARACTERISTICS ***

Tape is 7 track, 556 bpi density, even parity mode.

*** FILE STRUCTURE ***

Each file is terminated by an EOF mark and contains data for one cruise leg (about one ship-month).

*** PHYSICAL RECORD STRUCTURE ***

Physical records are fixed length of 8000 BCD characters containing 100 logical records of 80 characters each. The last physical record in each file is filled out to 8000 characters as necessary with blanks.

*** LOGICAL RECORD STRUCTURE ***

See sample below, reproduced from "Formats for Marine Geophysical Data Exchange", a publication of the National Research Council, National Academy of Sciences, June 1972.

Ship Cruise and Identification	Time Zone	Year	Month	Day	Hour	Minute	Latitude - decimal degrees (North is +; South is -)	Longitude - decimal degrees (East is +; West is -)	Navigation Point Identification *	Fix Description *	Azimuth of Current *	Velocity of Current *	Uncorrected Fathoms (800 fm/sec.)	Corrected Fathoms *	Matthews Zone *	Total Magnetic Intensity, Gamma	Residual Magnetic Intensity (Gamma)	Free-Air Anomaly *
ERDC02WT	-055	55	10	23	12	15	35.123	178.123	1234	1234	1234	2.7	1234	1234	1234	1234	1234	1234
000 00 00	000000	00	00	00	00	00	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
1111 111111	111111	11	11	11	11	11	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2222 222222	222222	22	22	22	22	22	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222
33333333	333333	33	33	33	33	33	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333
44444444	444444	44	44	44	44	44	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444
555 555555	555555	55	55	55	55	55	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555
66666666	666666	66	66	66	66	66	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666
77777777	777777	77	77	77	77	77	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
88888888	888888	88	88	88	88	88	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888
99999999	999999	99	99	99	99	99	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999

* = Fields not present (filled with blanks) on tapes generated at SIO as of April 1976. Each logical record includes time-date; position; depth in fathoms (800 fm/sec.); magnetic total field; magnetic residual (anomaly, with field removed with IGRF1965), all interpolated to even 5 minute intervals of ship time. Depth and magnetics originally logged at non-five minute intervals are interpolated if break in data does not exceed 15 minutes. If gap is greater, then that field is blank filled.

\$\$\$ END DOCUMENTATION - NGDC MERGE-MERGE FORMAT \$\$\$

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C *****
C ** DESCRIPTION OF **
C ** S.I.O. MODIFIED MERGED TAPES **
C *****
C
C
C
C DOCUMENTED BY STUART M. SMITH
C UNDERWAY DATA PROCESSING GROUP
C GEOLOGICAL DATA CENTER
C SCRIPPS INSTITUTION OF OCEANOGRAPHY
C LA JOLLA, CALIFORNIA 92037
C APRIL 1975
C
C
C *****
C *** GENERAL ***
C *****
C THIS FORMAT HAS BEEN DEVELOPED TO TRANSFER HISTORICAL S.I.O. DEPTH ,MAGNETIC
C FIELD,AND MAGNETIC ANOMALY DATA TO THE MARINE GEOLOGY AND GEOPHYSICS BRANCH,
C NATIONAL GEOPHYSICAL AND SOLAR-TERRESTRIAL DATA CENTER,
C ENVIRONMENTAL DATA SERVICE,NOAA,WASHINGTON,D.C.
C EACH FILE ON TAPE CONTAINS ONE OF THE THREE ABOVE DATA TYPES FOR ONE CRUISE
C LEG (ABOUT ONE SHIP-MONTH). EACH LOGICAL RECORD CONTAINS THE GMT TIME,DATE,
C POSITION, AND VALUE FOR ONE DATA POINT.
C
C
C *****
C *** TAPE CHARACTERISTICS ***
C *****
C TAPE IS 7 TRACK,556 BPI,EVEN PARITY MODE.
C
C
C *****
C *** TAPE ORGANIZATION ***
C *****
C EACH TYPE OF DATA(DEPTH,MAGNETIC TOTAL FIELD AND MAGNETIC ANOMALY) IS STORED
C ON A SEPARATE SERIES OF TAPES IN ALPHABETIC ORDER OF CRUISE NAME, ONE
C CRUISE LEG PER FILE. DEPTH IS ON TAPE 'MERDP-1' THROUGH TAPE 'MERDP-4'.
C MAGNETIC TOTAL FIELD IS ON TAPE 'MERMG-1' THROUGH TAPE 'MERMG-4'.
C MAGNETIC ANOMALY IS ON TAPE 'MERAN-1' THROUGH TAPE 'MERAN-4'.
C
C
C *****
C *** PHYSICAL RECORD STRUCTURE ***
C *****
C PHYSICAL RECORDS ARE FIXED LENGTH OF 8000 BCD CHARACTERS CONTAINING 200 LOG-
C ICAL RECORDS OF 40 CHARACTERS EACH(IDENTIFIER BLOCK IS AN EXCEPTION,SEE
C BELOW). LAST RECORD OF EACH FILE IS FILLED OUT TO 8000 CHARACTERS AS NECESS-
C ARY WITH BLANKS.
C
C
C *****
C *** LOGICAL RECORD STRUCTURES ***
C *****
C
C * IDENTIFIER BLOCK FORMAT * (THE ID BLOCK IS CONTAINED IN THE FIRST 80
C CHARACTERS OF THE FIRST RECORD OF EACH FILE).
C

CHAR.	FORMAT	VARIABLE
1-3	I3	FILE NUMBER ON SIO SOURCE TAPE
4-11	A8	SIO SOURCE TAPE IDENTIFIER
12-27	A16	FILE IDENTIFIER (SEE DESCRIPTION BELOW)
28-30	I3	CRUISE ID NUMBER (ASSIGNED IN CHRON. ORDER OF PROCESSING)
31-32	I2	HOUR OF FIRST NAV. POINT FOR LEG (SEE NOTE BELOW)
33-34	I2	MINUTE OF FIRST NAV. POINT
35-36	I2	MONTH OF FIRST NAV. POINT
37-38	I2	DAY OF FIRST NAV. POINT
39-40	I2	YEAR OF FIRST NAV. POINT
41-43	I3	TIME ZONE OF FIRST NAV. POINT
44-55	A12	DATE FILE ADDED TO SIO SOURCE TAPE

** NOTE ** TIMES ASSOCIATED WITH VALUES IN DATA RECORDS ARE IN GMT REGARDLESS OF TIMEZONE ORIGINALLY USED TO RECORD DATA. NOTE ALSO THAT THE TIME OF THE FIRST DATA POINT MAY OR MAY NOT BE AT THE SAME TIME AS THAT GIVEN FOR THE FIRST NAVIGATION POINT (EVEN AFTER CONVERTED TO GMT).

* FILE IDENTIFIER * THE 16 CHARACTER FILE IDENTIFIER IS LOCATED IN CHARACTERS 12-27 OF THE IDENTIFIER BLOCK. IT CONTAINS THE CRUISE-LEG-SHIP ID, FILE TYPE, AND FLAGS TO INDICATE POSITION CONTROL, UNITS OF MEASUREMENT, CALIBRATION OR CORRECTIONS APPLIED, AND DIGITIZING INTERVAL.

FILE IDENT.

CHAR.	VARIABLE	CONTENTS
1-4	CRUISE ID.	4 LETTER ABBREVIATION TO MATCH SAMPLE AND CRUISE INDEX.
5-6	LEG NUMBER	(01,02,3A,ETC. '-1' INSTEAD OF '01' INDICATES SINGLE LEG CRUISE.).
7-8	SHIP ID.	2 LETTER CODE TO MATCH SAMPLE AND CRUISE INDEX.
9	'-'	(MINUS CHARACTER).
10-11	FILE TYPE...	A=MAG ANOMALY VERSUS N=NAVIGATION OR T=TIME M=MAG. FIELD VERSUS N=NAVIGATION OR T=TIME D=DEPTH VERSUS N=NAVIGATION OR T=TIME G=GRAVITY VERSUS N=NAVIGATION OR T=TIME N=NAVIGATION VERSUS T=TIME
		FOR EXAMPLE, DT=DEPTH VS. TIME MN=MAG. TOTAL FIELD VS. NAVIGATION NT=NAVIGATION VS. TIME
12	UNITS.....	DEPTH..... F=FATHOMS M=METERS T=TIME IN SECONDS MAGNETICS.... G=GAMMAS M=MASSONS (SIO UNIT=GAMMA/5) GRAVITY..... G=GAUSS NAVIGATION... CSE/SPEED CHANGE R=REQUESTED CHANGE A=AUTO LOGGED


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C 13 CALIBRATION.DEPTH.....8=800 FM/SEC.
C OR 2=820 FM/SEC.
C CORRECTION 4=1463 M/SEC.
C 5=1500 M/SEC.
C M=CORRECTED BY MATTHEWS TABLES
C MAG ANOMALY..5=IGRF 1965.0
C MAG FIFLD....='*'
C NAVIGATION...TRACK ADJUSTMENT
C L=LINEAR INTERPOLATION BETWEEN FIX PAIRS.
C S=LEAST SQUARES FIT TO SERIES OF FIXES.
C H=HAND ADJUSTED TO TRACK CROSSINGS,ETC.
C
C 14 DIGITIZING..DEPTH, MAGNETICS,AND GRAVITY
C INTERVAL 1=1 MINUTE OF SHIPTIME
C TO
C 9=9 MINUTES
C T=10 MINUTES
C F=15 MINUTES
C H=HALF HOUR
C P=PEAK AND TROUGH OR CHANGE OF SLOPE.
C
C NAVIGATION...DEFINITION OF CSE/SPEED CHANGE IF
C AUTO LOGGING IS USED.
C 1=.01 MILE DEVIATION FROM PREVIOUS POINTS.
C ='*' IF NOT AUTOLOGGED.
C
C 15-16 POSITION....MAJOR CONTROL (CHAR. 15),MINOR CONTROL (CHAR.16)
C CONTROL S=SATELLITE
C C=CELESTIAL
C R=RADAR
C L=LORAN
C O=OMEGA
C D=DEAD RECKONING
C
C * DATA RECORD FORMAT * (TIME AND DATE ARE IN GMT)
C
C CHAR. FORMAT VARIABLE
C ----
C 2-3 12 YEAR
C 5-6 12 MONTH
C 8-9 12 DAY
C 11-12 12 HOUR
C 13-14 12 MINUTE
C 16-23 F8.4 LATITUDE(DECIMAL DEGREES,NORTH(+),SOUTH(-))
C 25-33 F9.4 LONGITUDE(DECIMAL DEGREES,EAST(+),WEST(-))
C 35-40 16 DATA VALUE,DEPENDING ON DATA TYPE
C DEPTH=FATHOMS(800 FM/SEC CALIBRATION).
C MAGNETIC TOTAL FIELD = GAMMA (TRUNCATED TO NEXT LOWEST
C 5 GAMMA MULTIPLE (E.G. 45784 STORED AS 45780).
C MAGNETIC ANOMALY = GAMMA (TRUNCATED AS ABOVE. REGIONAL
C FIELD REMOVED USING IGRF 1965.0 BY LINEAR INTERPOLATION
C BETWEEN NAVIGATION POINTS LOCATED NO MORE THAN
C 200 MILES APART ALONG SHIP TRACK.)
C
C $$$ END DOCUMENTATION - S.I.O. MODIFIED MERGED TAPES $$$

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Processed Through December 1977

Four track charts on Mercator projection at a scale of 0.312 inches per degree longitude accompany SIO Reference Report 78-15.

Chart 1: North Pacific Ocean

Chart 2: South Pacific Ocean

Chart 3: North Atlantic/Indian Oceans

Chart 4: South Atlantic/Indian Oceans

To obtain ozalid copies of these charts, contact:

Stuart M. Smith A-023
Geological Data Center
Scripps Institution of Oceanography
University of California, San Diego
La Jolla, California 92093

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